Chapter 1

Studies in Literature and Cognition: A Field Map

Alan Richardson

Introduction

Is there a cognitive literary criticism? Literary scholars have been producing work engaged with the findings and methods of the cognitive and brain sciences for over two decades now. During the 1980s, a series of important books and articles were published by Reuven Tsur, Norman Holland, Mark Turner, Robert de Beaugrande, and others arguing for a fundamental rethinking of literary theory, criticism, and interpretation in relation to the 'more powerful' psychological models emerging from new work on cognition and the brain (Holland 13).[1] For a good while, however, these critics failed to provoke much of a response from the literary academy at large, or even from one another. Only in the mid-1990s, with a small but steadily growing presence at professional meetings and the rapid exchange of information made possible by the World Wide Web, did an active community begin to constitute itself out of a geographically and intellectually diverse group of literary scholars interested in cognition and neuroscience. The formation of the Modern Language Association 'Cognitive Approaches to Literature' Discussion Group in 1998 marked both a new level of institutional recognition for cognitive criticism and the establishment of a productive area of common ground among scholars working with a remarkably diverse array of assumptions, methods, and goals.[2] In what follows, I seek to highlight this diversity and to elicit the theoretical and practical disagreements it represents. Although I have tried to be even-handed in my survey of various emergent approaches, I will also speak to the promise and limitations of each in turn.

One might object at the outset that 'cognitive' is too broad, too vague, or too unstable a term to characterize in any meaningful way the varied body of work discussed below. Used to distinguish cognitive *psychology* from the behaviorist approaches it largely displaced, 'cognitive' generally refers to an overriding interest in the active (and largely unconscious) mental processing that makes behavior understandable. Used in conjunction with *linguistics*, 'cognitive' sometimes distinguishes the work of George Lakoff from that of Noam Chomsky, although Chomsky appears as a founding figure in accounts of cognitive *science*.

'Cognitivism' will sometimes also be used to distinguish first-generation cognitive science, heavily influenced by artificial intelligence theory and prone to consider the mind as software running independently of its bodily or mechanical hardware, from later theories insisting on the special character of an 'embodied' or 'wet' mind. Nevertheless, 'cognitive science' and 'cognitive neuroscience' have remained useful if unwieldy terms, signifying (rather like 'feminist studies' or 'cultural studies') interdisciplinary ventures loosely held together by a set of common interests, allegiances, and reference points rather than a coherent discipline unified by shared paradigms and methodologies. Perhaps the most accurate definition of cognitive literary studies, then, would be the work of literary critics and theorists vitally interested in cognitive science and neuroscience, and therefore with a good deal to say to one another, whatever their differences.

The large potential for disagreement even at the most basic level should be stressed at the outset. At present, there is considerable debate among cognitive scientists and neuroscientists concerning such issues as the following: whether the mind is fundamentally modular or mental activity makes use of general processing strategies; how great a role, if any, is played by innate mental structures; and whether basic-level cognition involves the algorithmic processing of discrete representational symbols, or rather non-symbolic, associational processing analogous to 'neural network' processing in computers. There are important debates even on seemingly neutral issues such as whether it is correct to speak of a 'limbic system' in the brain. But if one is convinced that cognitive scientists and neuroscientists are asking the right questions, one can feel compelled not just to eavesdrop, but to join the conversation in advance of definitive answers. Waiting on the answers would be a dubious strategy for literary scholars in any case. Ellen Spolsky has trenchantly diagnosed the 'common mistake of interdisciplinary studies' as assuming that hypotheses presented in a field one follows as an 'amateur' are '(somehow) more reliable than the more familiar, but embattled assertions' in one's own field. She calls instead for a 'confrontation' between 'emergent theories of cognition' and literary reading strategies, noting that literary scholars uniquely can add the 'familiarity with complex texts and sophisticated interpretive practice' characteristic of their own disciplinary training to the debate (*Gaps* 2, 41). Mark Turner similarly argues (and the reception of his recent work among the cognitive science community attests) that literary scholars have crucial evidence – the evidence of the imagination working at its highest pitch – to bring to the table (*Death* 9-10). And after thirty-some years of lively discussion on issues of gender, culture, and history, literary scholars are poised to ask precisely the sorts of questions that cognitive scientists and neuroscientists are prone to neglect.

Even in its currently fractious and 'relatively primitive' state, cognitive science can in turn provoke needed self-reflection among literary theorists and critics (Crane 16). The Saussurean postulate of systemic linguistic arbitrariness, for example, though relied upon throughout structuralist and poststructuralist criticism, no longer seems tenable in light of post-Chomskian linguistics (Taylor, 5-15).[3] Psychoanalytical accounts of early development, which underwrite any number of

literary interpretations, have been rendered problematic at best by the past thirty years of empirical research in developmental psychology (Easterlin, 'Psychoanalysis'). The notion of 'interpellation' cited in many literary-theoretical accounts of subject formation seems remarkably thin and abstract in relation to the vast amount that has been discovered concerning child development and language acquisition over the past several decades.[4] The literary scholars cited below have already shown, in strikingly different ways, how productive an engagement with models, findings, and methodologies from cognitive science and neuroscience can become. In fact, its very diversity makes a distinct part of the current promise and excitement of cognitive literary studies. Acknowledging that no 'grand unified theories of mind and brain' are in sight, the neuroscientist V. S. Ramachandran has stated that the new mind sciences are still in a 'phenomena-driven stage' and recommends 'tinkering' as a legitimate research strategy (4-5). Tinkering with a wide variety of literary and imaginative phenomena, cognitive critics stand to contribute not only to literary studies but to the mind sciences as well. This diversity can be occluded, however, either by too narrow a view of the emerging field – concentrating on only one tendency among many – or by too broad a view, conflating cognitive literary criticism with related but distinct developments like 'evolutionary literary theory.' In proposing a set of heuristic categories for cognitive literary studies, I hope to convey a sense of the full array of work being done in the field without sacrificing its distinctive character.

I have not attempted to catalogue all of the relevant work that has been and is being done.[5] My focus here is primarily on work published within the last dozen years, with the aim of producing a map rather than a history of the field. It is further limited to work being done by scholars in departments of literature. The categories I develop are soft ones, meant to help bring the variety of work being done into view, with fuzzy boundaries and overlapping memberships.[6] They are also provisional: as new work develops, they will need to be supplemented or reorganized to keep track of the emerging field. For the purposes of this essay, I have grouped recent work in cognitive literary studies under the following rubrics: cognitive rhetoric (and conceptual blending), cognitive poetics, cognitive narratology, cognitive esthetics of reception, and cognitive materialism (and historicism). I also discuss evolutionary literary theory or 'biopoetics' as an outlier that helps define the boundaries of cognitive literary criticism proper.

In attempting to elicit the theoretical, methodological, and practical differences among scholars bringing literary studies into contact with cognitive science and neuroscience, I have kept an eye on a set of related questions. How do they define or account for literariness, if at all? What role do empirical methods play in their investigations? To what extent are invariant or universal aspects of human cognition and behavior addressed, and to what extent are they qualified by appeals to culture, history, and ideology? How much weight is given to adaptationist arguments or to arguments for cognitive flexibility within certain constraints? What stance is taken toward embodied, materialist, and/or computational accounts of mind? In pursuing these questions, I hope above all to provide a richer sense of the possible directions that future cognitive theory and

criticism might take. I will conclude by describing some of the general characteristics that have marked the most successful work to date, and are likely to help define the leading work of the foreseeable future.

Cognitive Rhetoric and Conceptual Blending Theory

Cognitive rhetoric is the only one of these heuristic categories based on anything like a school of affiliated critics. Mark Turner launched the project of a cognitive rhetoric in his impressive 1991 study, *Reading Minds*. He presents cognitive rhetoric as an offshoot from cognitive linguistics, that is, the approach to understanding the interrelated workings of the conceptual and linguistic systems developed by George Lakoff, Mark Johnson, and Turner himself (among others).[7] Cognitive linguistics breaks with the Chomskian tradition (which they call the 'generative' school) in displacing syntax with semantics as the center of linguistic study and grounding language in a general conceptual capacity rather than bracketing it off within a distinct mental module. According to cognitive linguistics, conceptual and linguistic activity is ultimately grounded in embodied human experience. As Turner memorably puts it, with an implicit appeal to evolutionary theory, linguistic acts are 'acts of a human brain in a human body in a human environment which that brain must make intelligible if it is to survive' (*Reading* vii-viii). The consequences of human embodiment affect the most basic level of concept formation, the primitive 'image schemata' that grow out of fundamental activities like ingestion, standing, bodily movement through space, grasping, and such consequences of the basic human body plan as front-back orientation and left-right symmetry. With their basis in the most common activities and the fundamental perceptual orientations of the body, image schemata provide a kind of template on which to build increasingly abstract concepts – or perhaps better, from which to imaginatively project them. For, in addition to being fundamentally embodied, the mind is also pervasively metaphoric, imaginative, or as Turner sometimes puts it, 'literary.' Far from constituting special and incidental features of poetic adornment, figures like metaphor and metonymy reflect basic cognitive operations that allow for the projection of image schemata onto a wide array of conceptual domains, building up the conceptual (and linguistic) system from its grounding in the 'skeletal images' arising from 'our bodily sense of spatiality' (*Reading* 57).

Robert Abelson, in an essay on 'Artificial Intelligence and Literary Appreciation,' describes an early text-processing program (FRUMP) that, fed a news article beginning 'The death of the Pope shook the world,' offered the following summary: 'There was an earthquake in Italy. One person died' (39). Exemplary failures in AI programs such as this help one understand Turner's considerable and infectious enthusiasm for the mind's everyday capacity to effortlessly and unconsciously process metaphors and other figures of speech. Indeed, elucidating the 'common conceptual and linguistic capacities' that account for the 'regularities' found across various readings of a given text forms the heart

of Turner's research program. To what extent these regularities constitute conceptual and literary universals is unclear; like others in the cognitive linguistic community, Turner is reluctant to speak of universals and is careful to emphasize the cultural component of a given conceptual system (*Reading* 21). Nevertheless, he illustrates the 'ubiquitous and irreducible' presence of figural structures in everyday language and thought with examples taken from many different traditions, non-Western as well as Western, and the grounding of these structures in common embodied experience would seem to account for their translatability across disparate cultural, linguistic, and historical traditions (*Reading* 20). Producing a rhetoric rather than a poetics, Turner equally emphasizes the continuities found among literary and non-literary forms of communication, and the 'case studies' in *Reading Minds* include studies of argument and categorization in addition to literary topics. In addressing the latter, Turner deliberately avoids all novel 'readings' in favor of demonstrating what is remarkable about the usually unremarked upon features of literary activity (*Reading* 19). If, as Spolsky has remarked, literary theories are judged by the appeal of the readings they produce, Turner's asceticism in this regard may have muffled the impact of his work and may partly account for the limited hearing it has gained among his home 'profession of English' (vii).

Turner's call to 'reconstitute' English studies has been taken up by a scattered group of adherents, however, who have produced 'cognitive' readings of texts ranging from Shakespearean drama, to Japanese haiku, to modernist lyrics (*Reading* viii). These readings, for the most part, purport to show how given literary works are structured by underlying metaphorical schemes elucidated by cognitive linguistics, readily identifiable from the block letters in which they are formatted. 'The analysis shows that the CONTAINER and PATH schemata dominate the salient metaphors of the play, as well as those of the critics who have written for the last two hundred years about *Macbeth*,' reads (in part) the abstract of a characteristically lucid example by Donald C. Freeman (689). As the second clause of Freeman's sentence suggests, these critics often follow Turner's example in demarcating an area of tacit agreement across a range of earlier readings rather than arguing for novel or original readings of the work in question. They rarely engage with recent criticism on the text or author in question in the jousting manner characteristic of much professional literary criticism, and their intended audience does not seem to include fellow specialists. In particular, the issues of gender, ideology, sexuality, race, and cultural difference that play so large a role in the literary criticism of the past quarter century are commonly ignored or, as in Margaret Freeman's interesting work on Emily Dickinson ('Metaphor Making'), feature only obliquely.

Turner has described his project not as erecting a 'theory of literature' but as establishing a 'common ground' that might support a number of different theories (*Reading* 22). Along with his emphasis on rhetoric and corresponding interest in extraliterary texts, this has made it hard to gauge the adequacy of cognitive rhetoric to support a theory of literature per se. Recently, however, Margaret Freeman has proposed a 'cognitive theory of literature' based on

principles derived from cognitive linguistics, appropriating Tsur's term *'cognitive poetics'* in place of Turner's 'cognitive rhetoric' ('Poetry' 253). Although Freeman draws on 'cognitive theories of analogical mapping, iconicity, and metaphor' in outlining her theory, it is the last term that gets the most attention, and 'cognitive poetics' (at least in this instance) becomes largely a matter of 'identifying the habitual and coherent conceptual metaphors a poet uses' ('Poetry' 270). (In a revealing aside, Freeman imagines the objection that 'All poets make extensive use of metaphor; that's what poetry is,' responding in her own voice, 'Just so.' ['Poetry' 266-67]). To make metaphor the central term in a theory of poetry, much less literature, however, is bound to strike many as grossly inadequate. Literary theorists have generally preferred more abstract and flexible concepts, like defamiliarization, deviance, or 'alternativity,' in seeking a common term for what makes literary discourse distinctively literary (Beaugrande 58). The canon of works most often analyzed by Turner's followers – Shakespearean drama, and Metaphysical, Romantic, and Modernist lyrics – will in fact seem familiar from the heyday of the New Criticism, with its own primary interest in the linguistic and conceptual structures motivating the figurative use of language.

Turner himself has, in any case, moved on from his earlier emphasis on cognitive metaphor to look more broadly at issues of what he and Gilles Fauconnier term 'conceptual blending.' In *The Literary Mind* (1996), Turner folds his thinking on metaphor into a larger concern with story, projection, and parable. Like some artificial intelligence researchers before him, Turner recruits the notion of 'story' from narrative theory to describe the dynamic patterns that structure experience, beginning with such micro-events as grasping an object or shifting one's gaze, and essential for initiating, performing, recalling, and remembering discrete actions.[8] 'Small spatial stories,' characteristic acts involving basic image schemata and instantiated in neurobiological patterns, now become the building blocks of cognitive activity, combined into larger and more complex narrative units than can in turn be 'projected' into various cognitive domains (*Literary* 16-17). 'Parable' describes the constant and pervasive use of one story to structure, explain, or comment on another, resulting in a creative blend that enables inferences that neither the source story nor the target story could supply by itself. Its use ranges from the quotidian – say, instructing a cook to just 'drizzle' some olive oil on the steamed vegetables – to the ingeniously literary, as in the complex blends Turner describes at work in *The Thousand and One Nights* and Shakespeare's *King John*. The point, though, is that the everyday mind *is* the literary mind, that seemingly specialized processes like story-making and parabolic projection are in fact constantly deployed within cognitive life. Although 'blending' theory, with its emphasis on novel blends and emergent structure, can be seen as more oriented toward literary originality than cognitive metaphor theory, with its emphasis on the 'entrenched' and conventional metaphors we live by (Grady et al. 101), Turner resists any firm distinction between literary and other forms of cognitive activity. An overview of blending theory written with Fauconnier, for example, explores instances from mathematics and jokes, news stories and novel linguistic constructions, advertisements and *Paradise Lost* ('Mechanism').

Conceptual integration theory also shows considerable promise for those cognitive linguists, psychologists, and rhetoricians engaged in reconsidering the 'cognitive webs' that link embodied minds to patterns of social interaction, communication, and the 'cultural world' generally (Gibbs, 'Taking' 146). In 'Deictic Projection and Conceptual Blending in Epistolarity,' for example, Vimala Herman stresses equally the embodied and the 'intersubjective' aspects of the deictic devices used to transform the 'disconnected' communicative mode of letter writing into the 'shared corporeal immediacies' conveyed by writers of epistolary fiction (523-5). In 'Conceptual Blending, Narrative Discourse, and Rhetoric,' Todd Oakley pays special attention to the role of conceptual blends in 'establishing and maintaining' group as well as individual identities, and in enabling the 'pragmatic principles' of communication as well as the creation of metaphors and other figures of speech (321-22). For both Oakley and Herman, conceptual integration theory helps reconnect the literary critic's traditional interest in figural language with the disciplines of rhetoric and pragmatics as they elicit the inherently social character of linguistic and literary exchange. Their promising recent work, along with Turner's new interest in story and parable, suggest that conceptual integration theory is developing in unprecedented ways that extend well beyond the presiding interest in metaphor that initially inspired literary critics to make common cause with cognitive linguists.[9]

Cognitive rhetoric and blending theory have as yet an uncertain empirical status. Cognitive linguists tend to make their cases through sheer accumulation of examples, sometimes claiming that the weight of linguistic and literary evidence gives their theories an empirical warrant (cf. Steen 200-1).[10] (Turner himself compares the case studies in *Reading Minds* to 'laboratory experiments' [viii].) This has done little to convince critics who would like something closer to the controlled, randomized, and double-blind experiments that constitute the gold standard for empirical studies with human subjects. On the other hand, Turner is widely versed in the cognitive neurosciences and has consistently striven to make his speculation neurobiologically plausible. It is noteworthy that the basic postulates of the Lakoff-Johnson-Turner group have gained the serious attention of leading neuroscientists like Gerald Edelman (246-52) and Antonio Damasio (223-44), though their own work is on the speculative end of research in neurobiology.

Cognitive Poetics

Cognitive poetics, a term devised by Tsur to characterize his longstanding research project, can also serve to describe the work of a disparate group of researchers with overlapping aims and methods. One shared feature is an emphasis on studying literariness and attempting to define the exceptional aspects of literary works, in contrast to the cognitive rhetorician's commitment to finding like mechanisms at work across a wide variety of discourses and cultural artifacts. Another concerns

the adaptation of various information processing models to describing the structure and reception of literary texts. One also finds a strong interest in empirical studies among this group and a history of collaboration with researchers in fields like cognitive psychology and applied linguistics.

Tsur begins *Toward a Theory of Cognitive Poetics*, his 1992 summa of over two decades of work on literature and cognition, by defining cognitive poetics as the attempt to determine 'how poetic language and form, or the critic's decisions, are constrained and shaped by human information processing' (xiii). He follows the tradition of Slavic poetics in viewing literariness in terms of defamiliarization, the 'systematic disturbance' of everyday cognition. Literary activity does not, that is, depend on special mechanisms, but rather makes special use of 'normal cognitive processes' by disturbing, deforming, or delaying their functioning (*Toward* 4). Tsur is especially interested in the capacity of literary works to evoke the 'pre-categorical flow of information' and '*thing-free qualities*' that ordinary perception and categorization procedures necessarily render unnoticed (*Toward* 21). This helps account for some of the pronounced affective qualities of literature: Tsur's use of the term 'cognitive' should not occlude his pervasive attention to affect and emotion.

Tsur also places cognitive poetics between 'analytic and impressionist criticism': the former excels at discriminating the structural features of literary works, the latter in describing their effects, while cognitive poetics tries to systematically relate one to the other (*Toward* 77). It does so, however, within the 'rigorous' constraints posed by the information processing models it adapts from cognitive psychology and linguistics as applied to a given set of structural features. In his book on the expressive qualities of certain sound patterns, for example, Tsur systematically tests longstanding associations between various sound patterns and perceived emotive or expressive effects against the acoustical analyses of the sounds in question, attempting at once to 'reclaim' an area of criticism from arbitrary impressionism and to render the 'reader's impression a legitimate and integral part of criticism' (*What* 63-64). This investigation eventually took Tsur to the Haskins Laboratories in New Haven, where he spent eight months attempting to experimentally verify the results of his earlier introspection and 'thought-experiments' (*What* x, 13). In his more recent book on *Poetic Rhythm* (1998), Tsur describes waiting for twenty-five years for 'experimental support' for his earlier work on poetic meter, as a breakthrough in 'instrumental phonetics' was required before the proper empirical tests could be performed (7-9). Although Tsur stresses that literary analysis cannot be *reduced* to formulations provided by more 'exact' sciences like psychology, phonetics, and acoustics, as the 'human *significance*' of literary texts remains paramount, 'cognitive theories' developed in consonance with work in 'more basic' fields can help ensure that the 'relating of perceived qualities to literary structures is not arbitrary' (*Poetic Rhythm* 339).

Tsur's patient grappling with key problems in poetics over several decades, his attempt to find a medium between impressionism and reductionism, his clarity of thought and purpose, and the genuine interdisciplinarity of his research should have given his work exemplary status within cognitive literary

studies, but in fact Tsur is rarely cited. One reason may be that Tsur advanced his pioneering work in poetics at a time when, in the Anglo-American academy, interest in poetics was diminishing almost to the vanishing point (Brooks). A second is that, especially before the advent of the World Wide Web, his work has been difficult to locate and obtain in the US and Great Britain. Finally, one of Tsur's virtues – his working knowledge of an exceptionally broad spectrum of twentieth century thought – may have occluded the innovative appeal of his work. In addition to cognitive psychology and theoretical and applied linguistics, Tsur draws throughout his work on Gestalt psychology, Russian and Prague formalism, analytic philosophy, structuralism, and Anglo-American New Criticism. The resulting 'eclectic' character of his work, along with the large range of topics it engages, may have worked against any claim to paradigmatic status (*Poetic Rhythm* 8).

One critic who does cite Tsur is David Miall, sharing Tsur's interests in literariness, cognitive and psycholinguistic processes, affect, Slavic poetics, and empirical methods. Writing with the cognitive psychologist Don Kuiken, his frequent collaborator, Miall has summarized some of the key aspects of their joint research program in 'The Form of Reading: Empirical Studies of Literariness' (1998). Opposing what they term the 'ontology of linguistic impermanence' informing much poststructuralist literary theory, Miall and Kuiken analyze a series of empirical studies (including some of their own) collectively suggesting that certain 'inherent properties of literary texts' promote a sense of literariness ('Form' 327, 332). 'Literature' is not, that is, merely a conventional designation for a given, arbitrarily selected group of texts but rather reflects the presence of textual properties at the grammatical, phonetic, and semantic levels that demonstrably inspire special text processing procedures in 'actual readers' ('Form' 328, 330). In this essay, Miall and Kuiken focus primarily on studies of various types of foregrounding, arguing that Russian and Prague School poeticians were correct in viewing foregrounding and defamiliarization as typical aspects of literary works ('Form' 330, 338). Foregrounding devices slow down decoding processes and elicit special kinds of readerly attention. Following Tsur, Miall and Kuiken suggest that slowing down and 'disturbing' the reader's categorization process can make 'pre-categorical' and 'lowly categorized' information manifest in 'moments of feeling' experienced by the reader. This may constitute one of the 'natural bases of literary response,' with adaptive value for an organism that, in Tsur's words, profits from 'flexibility, adaptability to ever-changing physical or mental environments' ('Form' 338). Affect is central, not incidental, to literary response, and the adaptive value of engaged, affect-charged reading may help account for the seeming universality of 'literary culture, whether oral or in print' ('Form' 328).

Miall and Kuiken's commitment to studying 'actual readers' leads them to confront some of the special problems involved in empirical studies of literary reading. A significant one is that literary education results in different patterns of response among more and less experienced readers, apparently supporting the conventionalist position that Miall and Kuiken oppose. The 'less experienced readers seem less committed to the act of reading,' they note in relation to studies

conducted by themselves and by David Hanauer. Nevertheless, they find a consistent relation between the presence of certain 'poetic features' and increased readerly attention, even if the rate of increase varies ('Form' 335). They also note the problem of the paucity of relevant empirical studies – the 'available research is limited' – leading to the 'predictable call for further research' ('Form' 339). At present, however, very few literary scholars have the training required to conduct such studies in a responsible manner: hence the exemplary value of Miall and Kuiken's collaboration. Miall is also interested, like Turner, in seeking congruence between his work on foregrounding, affect, and reader response and the neuroscientific findings of researchers like Damasio and Joseph LeDoux. 'While neuropsychology can as yet give us few answers to the complex problems posed by researchers in the reader response domain,' he concedes, 'it does offer a framework for formulating some of the key issues' ('Anticipation' 276). Good study design, in other words, will include a familiarity with work suggesting the neurobiological plausibility of the processes or mechanisms to be explored.

Miall and Kuiken's speculations on the universality of literary culture raise the issue of whether not just literary activity, but specific literary devices, forms, and techniques might constitute cultural universals. If some aspects of literary activity are tightly enabled and/or constrained by invariant features of human neuropsychology, do these occur across cultures in recognizable forms? Tsur also raises the issue of 'intercultural validity' in his study of expressive sound patterns (*What* 6), and has related the cross-cultural features of caesura placement to the constraints imposed by the limited span of 'immediate memory' (*Toward* 135). Patrick Colm Hogan brings his own interests in literariness, cognitive processing, affect, and the promise of empirical studies to the most considerable treatment of this issue to date, his essay 'Literary Universals' (1997).

Hogan begins by acknowledging the current bias within literary studies toward 'historical and cultural particularities,' in a word, toward 'difference' (223-24). He defines his purpose, however, not as displacing this bias but rather as reconfiguring it within a larger program that places 'cultural particularity' against the 'background of commonality' (226-27). Establishing this common background begins with the discrimination of literary universals, not to be confused with the chauvinistic projection of normative absolutes, which are in fact 'pseudouniversals' (225). 'Empirical universalism,' to the contrary, involves the 'isolation of genuine cross-cultural invariants,' '*statistical* universals' that need not be present in every literary work or every culture, but must occur across a 'range of genetically and geographically distinct' cultures (223, 228). One such universal is 'verbal art itself' (230) as cognitive critics since de Beaugrande have noted (57). Others include techniques like symbolism, image patterns, assonance, and verbal parallelism, narrative devices like foreshadowing and 'plot circularity,' the basic generic distinctions among poetry, narrative, and drama, and even some of the basic plots and character types found within many traditions of romantic comedy (229-32). Rather than obliterating cultural difference, searching for the presence of literary universals should elicit it. A reader not expecting to find allusion or

symbolism in a work from a different literary tradition may simply fail to look for it (227).

One of the chief interests of the discrimination of literary universals is its potential use for generating hypotheses for further research, both within empirical literary studies and cognitive psychology. Pursuing a description of (statistically) universal patterning techniques to a degree of abstraction sufficient to account for the widest number of instances, for example, Hogan arrives at the following formulation: 'a wide variety of formal literary techniques (alliteration, assonance, circularity, foreshadowing, etc.) function to maximize relevance or patterning across *encoded* properties or relations' (239). This is later qualified by the addition, '*with a normative limit at the point where such maximization would surpass the threshold of forced attentional focus*' (240). In its satisfying combination of precision and breadth of application, this formulation would seem valuable for researchers like Miall and Kuiken interested in empirically establishing typical features of literariness. In a discussion of universal constraints on poetic line-length that overlaps with Tsur's speculation on poetic caesurae, Hogan notes that the limits of 'rehearsal memory' apparently impose constraints on how long a poetic line can become.[11] Yet how *short* a poetic line can regularly become and still constitute a 'recurring rhythmic unit' raises a different set of questions that might provoke new studies of rehearsal memory on the part of cognitive psychologists (244). The study of literary universals profits from, but also feeds back into, the broader study of the 'human mind,' in 'uncovering genuinely universal principles of human thought and human society' (245).

The agenda that Hogan sets out in 'Literary Universals' is an immensely attractive one. As Hogan points out, however, pursuing the discrimination of literary universals entails an 'ongoing,' empirically sound 'research program,' one in this case 'involving the collaboration of a wide range of scholars in different fields, with different areas of literary expertise' (236). Again one hears the 'predictable' call for more research (Miall and Kuiken 339). What specific institutions, organizations, academic programs, print or online forms of scholarly communication will foster such research, however, is left unstated. The institutional questions for those proposing the empirical study of literature, especially given the anti-empirical climate of the Anglo-American literary academy at large, are crucial ones and cannot be held off indefinitely. Empirical research in the physical, social, and medical sciences is supported by an impressive network of training programs, apprenticeship opportunities, internal and external peer review mechanisms, support for collaborative work both within and across disciplines and institutions, and incentives for replicating – or throwing into question – the findings of other researchers. In the absence of anything approaching such a robust research culture, empirical literary studies are likely to play an important but minor role in the development of cognitive literary criticism.

Evolutionary Literary Theory

An empirically-based approach to literature also finds support, at least in theory, among the critics pursuing what is called 'evolutionary literary theory' or 'biopoetics.' In his essay on 'The Deep Structure of Literary Representations' (1999), for example, Joseph Carroll calls for an 'empirically grounded,' 'scientific' practice of literary analysis (160). This entails, as Robert Storey puts it in *Mimesis and the Human Animal* (1996), the 'complete abandonment of the poststructuralist paradigm in favor of a neo-Darwinian one' (xvi), an 'all or nothing' attempt, Brett Cooke declares in *Biopoetics* (1999), to reground literary study within the paradigms of sociobiology and evolutionary psychology (3-4). These critics share a set of interests in brain-based psychology, adaptationist theories of mind and culture, and literary universals that might seem to place evolutionary literary theory in close relation to the critical and theoretical practices discussed above. However, the biopoeticians are less interested in the neurocognitive, linguistic, psychological, and cultural levels of analysis at which most work in cognitive literary criticism takes place than in directly applying theories from 'evolutionary biology' to 'explain' literary behavior (*Evolution* 11). 'The human 'subject' must be newly defined in biological instead of linguistic terms,' Storey writes, as though these terms were mutually exclusive (xix). Carroll describes his guiding principle as the 'view that knowledge is a biological phenomenon, that literature is a form of knowledge, and that literature is thus itself a biological phenomenon' (*Evolution* 1). The error in reasoning, as well as a sense of what gets left out of Carroll's syllogism, becomes clear in the parallel argument: 'locomotion is a biological phenomenon, the airplane is a form of locomotion, the airplane itself is thus a biological phenomenon.' In ignoring the cultural and technological extensions of human knowledge while suppressing the linguistic and artifactual character of literature, Carroll excludes much of what cognitive criticism, like other forms of literary criticism, seeks to account for.

The urge to ground literary activity directly on 'common natural motives and feelings' launches Carroll into a series of theoretical and interpretive problems ('Deep' 165). I have discussed several of these elsewhere, in relation to the first interpretive example in Carroll's book, *Evolution and Literary Theory* (1995), where Carroll draws on evolutionary accounts of incest avoidance to argue that Catherine and Heathcliff cannot feel incestuous desire for one another in *Wuthering Heights* (Richardson, 'Rethinking,' 561-63). These problems come up as well in Carroll's more recent theoretical statements. One is that a dubious and unexamined role must be granted to authorial 'intuition' ('literary texts reflect an intuitive psychological understanding of human nature'), since many behavioral and cognitive processes remain closed to introspection and may even be counterintuitive ('Deep' 167). A second is that the fictional, fantastic, or 'offline' character of literary activity must be ignored in favor of a direct correlation between literary representation and patterns of behavior in the lived world, encapsulated in Carroll's belief in 'a primary, literal order of representations' ('Deep' 164). A third is that conflicting evidence, however blatantly obvious, must

be ignored. In his remarks on *Wuthering Heights*, for example, Carroll fails to account for the precedent (well-known to Brontë, her contemporary readers, and the critical tradition) of Byronic and other Romantic representations of incestuous desire. In the 'Deep Structure' essay, Carroll claims that in Jane Austen's *Pride and Prejudice* 'all of the characters in the narrative play the mating game, in accordance with sociobiological rules' (167-8), conveniently forgetting that Lydia, whose 'endangered' status he has just mentioned, rashly follows a sociobiologically 'masculine' strategy, choosing the prospect of immediate sexual gratification over any thought of long-term stability.

Carroll's selective approach to literary evidence touches on a larger problem within evolutionary literary theory: despite their professed belief in 'empirical' method, these critics base extremely broad claims on the slightest evidence. Storey, for example, supports his contention that boys naturally invent stories of war and aggression while girls prefer the interpersonal and domestic by reference to a single study, conducted with 137 young children living in or near New Haven, Connecticut, from 1955-58 (115-16). Not only is this quite a small and localized sample to support a universalist claim, but the time period in question is hardly a randomly chosen one. Millions of World War II veterans had recently returned as heroes to raise families and (as I can personally attest) boys' culture was saturated with war toys, military garb, and representations of combat. It was also a time of pronounced divisions in masculine and feminine behavior, partly fueled by the need to replenish a population reduced by war casualties, which further exaggerated Anglo-American women's traditional relegation to childbearing and childrearing since the early nineteenth century. It would be difficult to find a cultural moment *more* likely to encourage small boys to imaginatively identify with their warrior fathers and imitate their tales of battle. A few pages later, Storey supports a universal correlation between adolescence and 'ludic' absorption in narrative with reference to Joseph Appleyard's summary of research confined to the US and Great Britain in the mid-twentieth century (121). This strikes Storey himself as 'risky,' but his justification is revealing. 'Because man (including the American adolescent) has grown no new emotions since Homer's day, it seems legitimate to extrapolate from the experience of [Appleyard's] readers to speculate that narrative may have generally an age-sensitive appeal' (121). But why should it be 'legitimate' to presume what one has set out to prove, that basic human emotions and motives universally correlate with certain parameters of narrative response, independently of cultural historical change (including the epochal shift from orality to literacy)? Carroll, for his part, refers to one study of epics and one of 'popular women's fiction' in supporting his claim that in 'literature the most frequent and important themes are those that concern individual identity, sexual romance, and the family' ('Deep' 164). Even if one is untroubled by the vagueness of this statement (does Beckett's trilogy count as a work about the 'family'?), the thinness of the evidence cited contrasts markedly with the standards set by Hogan for discriminating literary universals.

In addition to their relative lack of interest in the linguistic, cognitive, and cultural domains, their literalist take on fiction, and their unscientific approach to

empirical evidence, the evolutionary literary theorists contrast with the other critics discussed here in their high evaluation of the progress of scientific psychology and their lack of emphasis on cognitive and behavioral flexibility. It is standard in cognitive literary criticism to acknowledge the provisional status of current work on cognition and the brain. (Most cognitive scientists and neuroscientists who write about the arts begin with a comparable gesture.)[12] But for the biopoeticians, sociobiology and evolutionary psychology have already arrived at a mature enough science of mind and behavior to delineate a 'comprehensive conception' of 'species-typical human characteristics' ('Deep' 162). Cognitive critics who draw on evolutionary theory generally stress, rather than minimize, human cognitive flexibility and creativity (Spolsky 2, 40). (The emphasis on flexibility in human cognition and behavior can be found as well in the work of leading neo-Darwinists like Richard Dawkins and Daniel Dennett [Richardson, 'Rethinking' 563].) When Paul Hernadi and Francis Steen, for example, argue for the adaptive value of proverbs, they point not to a tightly constrained behavioral repertoire but to the 'multiplicity of behavorial options faced by human beings in our relatively recent evolutionary past' (9). 'Nature cannot accommodate itself with sufficient speed to the ceaseless proliferation of possible futures, so proverbs are needed to give us brief, memorable, intuitively convincing, and socially sanctioned guidelines' (7). However, they also acknowledge the cautionary statement, by the prominent neo-Darwinist George Williams, that 'evolutionary adaptation is a special and onerous concept that should not be used unnecessarily' (10). This is one quotation that all critics interested in cognitive and evolutionary theory might want to learn by heart.

It would be misleading to suggest that all of the work currently being done under the rubric 'evolutionary literary theory' lacks in methodological rigor or intellectual sophistication. Ellen Dissanayake's work in evolutionary esthetics, for example, offers a nuanced evolutionary account of universal human artistic behaviors, without losing sight of cultural differences, or making uncritical use of the 'truths' of evolutionary psychology. Some of the more trenchant critiques of the misuse of evolutionary theory by literary scholars have been made by Nancy Easterlin, who writes from within the 'evolutionary literary theory' grouping ('Do Cognitive,' 'Voyages'). The essays in this volume by both Lisa Zunshine and Blakey Vermeule deploy concepts from evolutionary psychology while taking exemplary account of cultural specificity, cognitive flexibility, and the special problems and opportunities posed by fictive works, marking (like Easterlin's recent essays) a significant area of overlap between evolutionary literary theory and cognitive literary criticism. As an identifiable critical movement, however, evolutionary literary theory has become associated with reductionism, over-generalization, literalism, and cultural nostalgia, tendencies that most cognitive critics have, by contrast, explicitly argued against.[13]

Cognitive Narratology

Cognitive psychology, artificial intelligence, and narratology have long shared a vocabulary of common terms like 'scripts' and 'frames,' 'story grammars' and 'text processing,' so it is not surprising to find a history of interchange among them. Manfred Jahn, who characterizes his research as 'cognitive narratology,' traces the 'process turn' in narratology back to formative work by Meir Sternberg and Menakhem Perry in the late 1970s ('Speak' 169). David Herman, who is developing a closely related 'cognitive approach to narrative discourse' ('Scripts' 1049), also cites the important precedent of Marie-Laure Ryan's *Possible Worlds, Artificial Intelligence, and Narrative Theory* (1991) and kindred developments like Monika Fludernik's 'natural' narratology ('Parables' 23 note 7). In addition to a shared emphasis on cognitive processing and the adaptation of terms from artificial intelligence, Herman and Jahn both seek to build on the partial successes of structuralist narratology, describing their position as 'postclassical' rather than 'poststructuralist' (Herman 'Scripts' 1048-49, Jahn 'Speak' 169). Indeed, Herman has faulted Turner's 'pathbreaking' work on blending, story, and parable for ignoring several decades of important developments in narratology and producing an 'undernuanced' account of narrative as a result ('Parables' 22).

In 'Scripts, Sequences, and Stories' (1997), his 'prolegomena' for a cognitive narratology, Herman argues that the notions of schemata, scripts, and frames as developed within artificial intelligence are especially helpful for elucidating the procedures by which readers negotiate narrative texts. Narrative 'competence' is recast as a 'nested structure of processing strategies' operating at different levels (or during distinct phases) of comprehension. Readers bring repertoires of frames and schemata to a given encounter with a text, stored representations that allow readers to identify certain sequences as stories, to place them within familiar genres, and to relate expressive as well as formal features of an unfolding text to judgments about its type and degree of 'narrativity' ('Scripts' 1053). Noting that 'narratives can anchor themselves to stored world knowledge in vastly different ways' ('Scripts' 1054), Herman argues further that differences in congruence between given narratives and a culture's conventional scripts can change across genres and over time, outlining an approach to literary history that would center on the 'comparison of shifts in narrative form with changing world models' ('Scripts' 1055). Elsewhere, Herman has argued that ideologies can be thought of as 'self-transcendentalizing' narratives that 'obscure their own groundedness in a specific place and time,' attempting to position themselves outside of historical change and thus beyond criticism ('Parables' 33). These gestures toward literary history and ideological critique make important exceptions to the usual bias in cognitive literary criticism toward synchronic over diachronic accounts.

Jahn also makes use of models of cognitive processing in his pursuit of a 'genuinely reader-oriented' narratology ('Frames' 441). In addition to adapting artificial intelligence conceptions of frames and scripts, Jahn borrows Ray Jackendoff's theory of 'preference rules' in accounting for the reader's real-time

negotiation of competing or ambiguous models and returns to notions such as the 'Proteus principle' and 'primacy' and 'recency' effects earlier developed by Sternberg and Perry. Readers, according to Jahn, bring an internalized system of narrative situations with 'canonical features' or 'defaults' to a given reading experience, 'sets of conditions' that can be realized in numerous ways ('Frames' 446). Preference rules provide the reader not with hard-and-fast laws but with a graded set of options (prefer a, then prefer b, then prefer c . . .) that can be discarded, one by one, if they prove infelicitous. 'Garden-paths' such as 'the horse raced past the barn fell,' which are designed to trigger an infelicitous preference early in the reading process, reveal in their difficulty and disruptiveness the ordinarily smooth functioning of the cognitive mechanisms that readers bring to texts ('Speak' 170). In his reading of James Thurber's 'The Secret Life of Walter Mitty,' for example, Jahn points out that a reader's ordinary 'default preference' in beginning a narrative is to assume that the first fictional world encountered is the text's 'actual world' and that the alternative worlds encountered in dreams, fantasies, interpolated stories, and the like will be introduced later. 'Mitty' owes much of its interest to violating this rule in its opening pages, deliberately 'garden-pathing' the reader into mistaking Mitty's fantasy world for his actual world (as, apparently, Mitty himself is inclined to do). 'Mitty' engineers a 'preference-rule system failure' that causes the reader to momentarily share Mitty's own sense of ontological confusion ('Speak' 184-86).

While cognitive narratology can provide a richer and more nuanced sense of 'story' than the one that emerges in Turner's *Literary Mind*, it also shares a potential limitation of cognitive rhetoric in offering no theory of 'literariness.' Like other schools of narratology, cognitive narratology prefers to investigate what Herman calls 'narrativity' ('Scripts' 1048) and does not attribute a distinguishing quality or set of qualities to literary texts, in stark contrast to the work in cognitive poetics discussed above. Another contrast with cognitive poetics involves a relative lack of interest in empirical studies. Although Jahn notes that processing phenomena like the garden-path effect are 'empirically measurable' facts ('Speak' 191), and comments elsewhere on the possible differences between the 'cognitive strategies' employed by 'sophisticated' and 'general' readers ('Frames' 464), the 'research strategy' outlined by Herman and Jahn does not yet include an empirical component ('Scripts' 1053). Cognitive narratology also departs from both cognitive rhetoric and cognitive poetics in showing little or no interest in the mind's embodiment, perhaps not surprisingly given its primary engagement with artificial intelligence and computational theories of mind. In contrast, both of the remaining groups of critics yet to be discussed view the mind's instantiation in the human brain and body as crucial to understanding the production and processing of literary texts, though with different emphases.

Cognitive Esthetics of Reception

'Cognitive esthetics of reception' is a term used here to describe the work of Ellen Esrock and Elaine Scarry, who have each written important books on mental imaging in literary reading. In markedly different ways, their work brings together the traditional concerns of philosophical esthetics (including the question of 'aesthetic merit' [Esrock 1]) with those of literary criticism, reader response theory, and the relation between sense experience and image production. Both critics draw on cognitive psychology and neuroscience for key terms and models, bringing the study of the literary imagination into a dialogue with research on vision and mental imagery. In terms of methodology, organization, and general tone, however, their books could hardly be more different.

Esrock sets herself several distinct, though closely related, tasks in *The Reader's Eye: Visual Imaging as Reader Response* (1994). One is to establish the 'marginalization' of imaging throughout twentieth-century esthetic theory, literary criticism, and reader response theory alike (78). This raises important questions about the historical variability of reading styles, which can be affected by the expectations, 'attitudes,' and type and amount of literary training that readers bring to their encounters with literary texts (93). In addition to individual variation, that is, one might expect historical variation in how regularly and intensively readers attempt to visually imagine literary descriptions, depending on whether imaging is marginalized or prized by a given culture and its critical and pedagogical institutions. A second section of Esrock's book is devoted to surveying cognitive and neuropsychological studies of imaging, seeking to 'demystify' empirical imagery research for the literary scholar. Esrock also provides a discussion of the affective aspects of imagery in relation to psychoanalytical theory, and a reading of Italo Calvino's *Invisible Cities* as a work intended to elicit a range of imaging responses in its readers. Although one might wish for much more in the way of extended analysis, Esrock helps set the parameters for future work in the area. She establishes a significant role for mental imaging in relation to several dimensions of the reading experience, including memorability, clarity of spatial description, affective response, the concreteness of a given fictional world and the reader's sense of implication in it.

Scarry's *Dreaming by the Book* begins abruptly, without preface or introduction, credo or apology. Her argument takes for granted issues that for Esrock are still unresolved. On the imagery debate, for example (the question of whether the mind-brain makes use of analog mental images or relies on symbolic coding that somehow produces 'pictorial' effects), Esrock is cautiously agnostic (16-17), while Scarry simply accepts Stephen Kosslyn's influential arguments on the analog side and presses forward (255-56, note 5). What is crucial is that 'imaginary mimesis' follows the 'constraints' and relies on the neural and cognitive mechanisms of 'actual perception' (50). The 'great sensory writers' achieve vivacity, overcoming the thinness of mental images noted by esthetic philosophers from Aristotle to Sartre, by studying these constraints and mechanisms through intense introspection, and then producing a 'transcript of how

the brain works' in their verbal descriptions (21, 244). For Scarry, these descriptions are best thought of as sets of 'instructions' for the reader to follow in imaging – hence the title phrase 'dreaming by the book' – that bring about a 'radical change from daydreaming to vivid image-making' (31). Drawing on her own introspection and extensive practice as a trained and devoted reader and re-reader of 'great writers,' Scarry educes a convincing list of such instructions, describing how effects of vivacity, solidity, radiance, 'stretching, folding, and tilting,' and certain kinds of motion have been produced by poets and novelists from Homer to the present (6, 111).

Many, but not all, of Scarry's examples are convincing. She makes frequent use throughout of thought experiments – some ingeniously designed – so that her readers can test the various procedures Scarry has drawn from her own reading practice and attempt to produce comparable results. This gives Scarry something like an empirical warrant for her claims: 'if we measure the strength of the argument by its ability to produce practical outcomes, then we shall see that it at least partially succeeds' (256). Reading the book becomes a sustained exercise in 'imaginative cognition,' as the reader gamely and 'continually' attempts to reproduce the effects described (65, 243). What the method gains in immediacy, however, it loses in objectivity, leaving any given reader free to disprove any or all of Scarry's points in the course of performing the book's series of 'mental Olympics' (195). For this reader, many of the thought experiments succeeded spectacularly, while others, especially those involving flowers, produced negative results. These mixed results touch on the issues, discussed by Esrock, of individual and historical variations in reader response. Scarry, for example, seems exceptionally interested in flowers, so the vivacity of the particular kinds of floral description she discusses may be an artifact of her extensive experience with and sheer pleasure in imagining day-lilies and irises. (Or, I could be uncommonly dull and apathetic where flowers are concerned.) The more generic exercises, however – making a hard surface seem solid by mentally drawing a filmy one across it, making solid objects more vivid by imagining the play of their shadows – produce (again, at least in my case) powerfully convincing results, perhaps because they appeal to a much broader range of quotidian experience.

A related question concerns the issue of historical changes in reception style: one needs to presume a good deal of uniformity from Homer's listeners to Heaney's silent readers to accept the full weight of Scarry's claims. Her implicit answer is that perceptual and hence imaginative processes are likely to show a good deal of conformity over a mere few thousand years of evolutionary time. Yet she also acknowledges both the role of training – her book itself is designed to make the reader more responsive and agile as it progresses – and the possibility that cultural changes, like the visual saturation through 'dazzling new technologies' that marks contemporary urban life, might significantly alter the practice of image-making (249). Finally, a less visually oriented reader might want more attention to the other 'sensory modes' that Esrock mentions in passing, especially the auditory and the kinesthetic, though that would mean asking for a different book (204). These unresolved questions do not, however, make Scarry's

work less important. In discriminating, describing, and teaching readers to reproduce a number of striking literary effects that have eluded previous critics, Scarry exemplifies the 'good reading' that for Spolsky makes literary critical texts persuasive (3).

Cognitive Materialism and Historicism

Other 'cognitive' critics have related the embodied character of human mental life to the production as well as reception of literary works. In *Gaps in Nature* (1993), Ellen Spolsky established a distinct agenda for cognitive literary criticism. Drawing eclectically but cannily on a variety of neuroscientific, computational, and neurophilosophical accounts of mental functioning, including Jackendoff's 'preference' model, Jerry Fodor's 'modularity' hypothesis, Gerald Edelman's 'neuronal group selection' theory, and Daniel Dennett's notion of 'gappy' consciousness, Spolsky argues that the 'structure of the brain itself' guarantees a certain amount of cognitive instability and hence flexibility (40). Cognitive modules do not communicate seamlessly with one another (nor, in adaptationist terms, should they), but rather remain partly incommensurable, thus allowing for the possibility of correction and the continual introduction of change into the mind-brain system. Processing levels within modules (like David Marr's 3-D and 2 1/2-D levels within the visual system) show comparable gaps and incommensurabilities. If Edelman is right, the mind-brain is fuzzy and 'gappy' all the way down to the neuronal level. The resulting friction – between modules, between processing levels, between competing neuronal groups – keeps the mind on edge, open to enregistering new information (because the virtual world it creates is *not* smooth and seamless) yet also designed to seek creative ways to bridge the inevitable gaps. Like Turner, Spolsky finds in metaphor a telling instance of the mind's characteristic creativity, yet Spolsky is primarily interested in the novel metaphors that record provisional responses to an ever-changing series of 'gaps' rather than the conventional metaphorical patterns that for Turner make everyday cognition possible. Correspondingly, Spolsky is less intrigued by mental processes and products that reveal continuities between the literary and the quotidian, than by the 'heroic efforts of particularly responsive minds,' recorded in a 'culture's most powerfully imaginative texts,' to bridge the cognitive gaps (2).

Another key distinction between Spolsky's agenda and that of cognitive rhetoric concerns her wish not to displace but to supplement poststructuralist approaches to literature like deconstruction and the New Historicism. Granting a large role to cultural construction in the development of a given mind, Spolsky adds that human minds are designed (by evolution) to function in a manner that guarantees the potential disruption of ideological and cultural conditioning. Gaps and discontinuities in the perceptual and interpretive systems constitute 'necessary and innate aspects of our genetically inherited epistemological equipment' that constantly allow for the possibility of creativity, change, and dissent (192). Thus a 'materialist, biologically-based cognitive science' can serve as a 'counterweight to

current materialist historical scholarship,' with its contrasting emphasis on cultural construction and ideological interpellation (40). Whereas recent forms of historical or cultural materialism have viewed the body itself as a 'cultural construction,' dismissing biology and psychology together as 'essentializing discourses' (Fuss 50), Spolsky finds in biological, brain-based theories of mind an alternative materialism that acknowledges the consequences of human embodiment. Far from leading to 'determinism,' however, brain-based materialism accounts for the 'crucial entry for novelty' and capacity for ideological resistance that cultural materialisms have such notorious difficulty in explaining (192-3).

F. Elizabeth Hart also seeks to supplement 'postmodern' accounts of language, subjectivity, and culture with a 'theory of the material embodiment of the subject in and through language,' in this case adapted from cognitive linguistics ('Cognitive' 21). Rather than displacing the poststructuralist scaffolding of much current theory with cognitive linguistics, as Turner seeks to do, Hart proposes instead an 'engagement' between cognitive theories of language and 'poststructuralist theories of culture and history' that would produce a 'middle' position stronger than either could be alone ('Cognitive' 3). Hart sketches the outlines of such a position in her important essay, 'Matter, System, and Early Modern Studies: Outlines for a Materialist Linguistics' (1998). Noting that poststructuralist attempts to produce a 'viable historical materialist dialectic' within early modern literary and cultural studies have reached an impasse, Hart offers cognitive-linguistic and related theories of embodiment as necessary correctives for the 'vestigial formalisms' haunting theories derived from Saussure, Derrida, and Lacan. By ignoring the 'cognitive, indeed the biological foundations' of language and culture ('Matter' 314), and maintaining the 'subtle top-down formalism' that inheres within Saussurean linguistics with its idealist notion of the 'concept,' poststructuralist theory ends up with a 'totalizing,' ungrounded, and crypto-formalist version of the 'language system' ('Matter' 318, 321-2). A materialist linguistics that recognizes the 'rootedness' of the semantic system in the 'material cognitive system' – that is, the brain and body – would provide the basis for a 'bottom-up' theory of subjectivity, consciousness, and culture ('Matter' 328). Yet it would also maintain 'key insights into the characteristics of ideological constructivism' achieved by several decades of poststructuralist thought, seeing continuity between 'small-scale metaphoric processes that derive from a subject's historical contingencies' – like the 'small spatial stories' discussed by Turner – and 'large-scale ideological processes that function at the level of culture' ('Matter' 328).

The attraction of Hart's program should be obvious: it would allow literary critics to hold on to much of what they find most valuable in recent literary and cultural theory while offering a way forward through a more rigorous materialism congruent with, rather than tacitly opposed to, the materialism of cognitive neuroscience. Like some of the other promising work considered here, Hart's system as yet exists only in outline, and full evaluation will have to wait on its further development. One potential problem to note, however, is that in its marked preference for 'bottom-up' models, Hart's system may lose sight of the

dynamic interaction between bottom-up *and* top-down models and processes that characterizes a range of cognitive and computational theories and plays a crucial role for critics like Turner, Jahn, and Spolsky ('Matter' 316). Frames, scripts, metaphorical schemata, preference rule systems, and the like all bring top-down processing into prominence – whether or not they are understood as initially built up in a bottom-up manner – and in fact constitute much of what initially defined the 'cognitive' aspect of cognitive science. There is nothing in her theory as currently stated that would rule out such an interest in the future, however, and indeed Hart's essay in this volume shows a productive engagement with what Jahn calls the 'mechanics of top-down/bottom-up hermeneutic processes' ('Frames' 441).

Mary Crane shares Spolsky's and Hart's orientation toward the brain as the 'material site where discourse enters the body' and similarly locates her work between cognitive and poststructuralist accounts of subjectivity, language, and culture (7). Unlike Hart, however, who often limits herself to brief interpretive illustrations, or Spolsky, who chose in *Gaps* to interpret interpretations of literature rather then literary works themselves, Crane offers a series of full-length, detailed readings of a (perhaps *the*) celebrated canonical author in *Shakespeare's Brain* (2000).[14] In taking on Shakespeare's plays, Crane not only applies her version of cognitive literary criticism to texts that have long held monumental status, but enters into a sustained dialogue with a daunting interpretive tradition as well. Crane pays special attention to various strands of poststructuralist criticism for reasons analogous to Hart's: she wishes to supplement cultural materialist readings of Shakespeare with the 'more radical materialism' she derives from the 'cognitive emphasis on the embodiment of thought' (17). Like Spolsky, Crane wants to counterbalance the 'powerful role of culture in forming the subject' with the 'interaction between a biological subject and its culture' (21); the language of a given author reflects the 'clash of physiological and cultural constraints,' allowing for a certain measure of (personal and authorial) agency and the possibility for cultural change (32).

Crane brings the physiological to bear on the cultural in at least three different ways throughout the book. Primarily, she draws on cognitive linguistics (and to a lesser extent, post-Chomskian psycholinguistics) in theorizing a fundamentally new approach to understanding Shakespeare's famously complex and brilliant use of language. As Crane boldly puts it, certain characteristic operations of 'Shakespeare's brain' leave their mark in analyzable ways throughout the linguistic structure of his texts, most saliently (here) the 'polysemy and prototype effects' that give Crane a new way of talking about the linguistic patterns and 'image clusters' that earlier critics have noticed in specific plays (4). Crane's textbook example is her reading of *Twelfth Night*, in which she argues that various meanings of the word 'suits' – feudal suits, law suits, love suits, behavior that suits, suits of clothes (including theatrical costumes) – reflect the workings of a 'complex polysemous network' in Shakespeare's linguistic brain, one that enables him to deftly interweave seemingly opposed 'concepts of gratification and control, pretense and manifestation of actual status' (102). As this list implies,

Crane is especially intrigued by semantic networks that tie into issues of ideology, desire, and cultural fashioning – the staples of poststructuralist Shakespeare studies – as well as to self-reflexive themes of theatricality and performance. Moreover, Crane does not view these issues as static cultural givens that Shakespeare's plays merely reflect, but as indices of social and ideological transformation that are effected as well as reflected by linguistic change. Shakespeare's language at once participates in this change, records it for critical posterity, and suggests ways that change is constrained by the 'language-processing functions' of a brain similar in kind to those studied by cognitive scientists in the present (15, 25).

Crane also makes use of cognitive and neurobiological theories of language, self, and consciousness to critically expose some of the excesses of poststructuralist theory. 'Agency,' for example, may be (as much poststructuralist critique would have it) illusory, but if so it seems to be not a modern bourgeois construction but an adaptive illusion that informs the 'most basic levels of language' across cultures and eras (22). Self and consciousness may be largely produced by 'discourse,' but discourse itself is constrained (as cognitive linguistics argues) by a cognitive conceptual system that is ultimately grounded in 'prediscursive experiences of embodiment' (8). These basic theoretical differences have interpretive consequences that tend, overall, to make for a more author-centered and humanistic, less pessimistic and bleak reading of Shakespeare's plays than has recently been the norm. On the other hand, Crane herself offers such tough-minded conclusions as, 'no one in [the] Vienna [of *Measure for Measure*] is liberated by the possession of an open and vulnerable body' (176). Crane's reading of *Measure for Measure*, focusing on a set of pun-like connections among various linguistic uses of the term 'pregnant,' reveals a third basic strategy, the heuristic use of current neurobiological theories of the embodied self to elicit a richer sense of the 'early modern humoral physiology' known to Shakespeare with a 'pre-Cartesian, Galenic materialism' of its own (14, 17). Since Descartes' error had yet to be promulgated, Shakespeare's Galenic understanding of mind-body interrelations may have more profound sympathies with, say, Antonio Damasio's post-Cartesian understanding of the self than with the poststructuralist versions of materialism that, as Hart claims, harbor a latent idealism.

Between the seriousness of its engagement with recent poststructuralist criticism and the compelling ingenuity of its readings, *Shakespeare's Brain* is likely to reach and at least disarm, if not convert, a much larger group of professional readers than cognitive literary criticism has to date. Some readers who are already convinced of the promise of cognitive approaches to literature may find Crane's concessions to readers in her field overly generous, particularly her refusal to claim any special warrant (empirical or otherwise) for a cognitive approach. Others may balk at a hypostatized version of 'cognitive theory' that pulls conflicting (and potentially contradictory) models into a single, sometimes vaguely defined entity. In declaring, for example, that 'according to cognitive theory,' language is 'built *on* innate syntactic capacities and constraints and builds *up* meaning based on experiences of living in the body in a given culture' (42), Crane seems to be fusing generative (Chomskian) notions of syntax and cognitive

(Lakoffian) notions of semantics that neither linguist would deem compatible (however desirable some such synthesis might be in the abstract). Though not immune to challenge, however, Crane's careful synthesis of a range of cognitive and neuroscientific models in *Shakespeare's Brain* will provide those new to the field with an excellent foothold. Others will welcome it as a provocation for further theoretical refinement.

In adapting concepts from cognitive linguistics and neuroscience to elicit the subject's 'permeability' within '*early modern* cognitive theory' (170, my italics), Crane's work shades into what Francis Steen and I have called 'cognitive historicism' (Richardson and Steen 5). Cognitive models and theories can open up new readings of an earlier era's literary, philosophical, and scientific discourses on mind and language, not because earlier notions somehow 'anticipate' current ones, but because new interests, concepts, terms, and methods bring with them new perspectives on the historical record. Crane's most sustained example is her reading of *Hamlet*, which draws both on cognitive neuroscience and poststructuralist theories of performativity to highlight a range of competing constructions of subjectivity within Shakespeare's dramatic investigation of 'interiority' (116). The tension between 'physiological' and 'performative' approaches to subjectivity in the present helps bring out the 'various versions of cognitive subjectivity' available to Shakespeare and enacted in the plot of *Hamlet* (124). In 'Coleridge and the Dream of an Embodied Mind,' I have similarly made use of competing contemporary notions of the 'unconscious' (psychoanalytical and cognitive) in framing a new perspective on Coleridge's innovative thinking on non-conscious mental life in relation to the scientific psychologies of the Romantic era. And the philosopher John Sutton, in his comparable work towards a 'historical cognitive science,' has delineated a 'seventeenth-century French connectionism' in the theories of 'early modern neurophilosophers' through comparison with recent connectionist accounts of memory (1, 16). It may seem troubling that analogs to current cognitive-neuroscientific models have been found in pre-Cartesian (Crane), post-Cartesian (Richardson), and Cartesian (Sutton) 'neurophilosophies' alike. But in fact the current array of competing cognitive and neuroscientific models is so varied that scholars might well come up with a comparable array of new perspectives on the past. So long as recent models and theories are not naively imposed on the thought of earlier eras, but rather used to provoke historically rigorous reconstruction of past conceptions, cognitive historicism should prove a refreshing supplement to investigations guided by psychoanalytical and poststructuralist preconceptions concerning mind and language.

Conclusion

Vital and innovative work is currently being done across the entire spectrum of cognitive literary criticism surveyed above. Assessments of the emerging field usually end by recommending one or another direction for future work, and the examples of Turner, Scarry, Hart, and Crane have all been singled out as especially promising.[15] In addition to this important (and diverse) set of precedents, however,

recent publications by Miall, Jahn, Steen and Hernadi, and Vimala Herman all suggest that significant new approaches are being developed in a number of different areas within what can broadly be termed cognitive criticism. There is every reason to wish, then, that the new field should continue to foster a diverse array of critical models and methods. Yet, as much work being done under the rubric of evolutionary literary theory suggests, some roads are better not taken. A significant area of tacit agreement on key methodological, theoretical, and pragmatic issues can be found running through a good deal of the most compelling work described above. The most important of these common features could be abstracted and enumerated as follows.

1. In the absence of convincing arguments for eliminative materialism or 'consilience' with the physical sciences, cognitive literary criticism takes a non-reductionist position. It is committed to the enduring value of explanations at the literary and cultural levels of analysis, although it constantly seeks coherence with the most convincing available explanations at other levels: linguistic, anthropological, psychological, cognitive, neurobiological.
2. While underscoring the metaphoricity of much linguistic activity and acknowledging the continuities between literary activity and everyday cognition, cognitive criticism also seeks to account for the salience of novel tropes and to address issues of literariness and esthetic value. The successes of recent work in 'blending' theory reflect a growing interest in linguistic novelty and literariness that contrasts with an earlier emphasis on 'metaphors we live by.'
3. Examining the role of invariant features of cognition in literary production remains a distinctive aspect of cognitive literary criticism. Yet literary universals cannot be understood apart from the specific sociocultural contexts in which they are instantiated. Cognitive approaches are at their best complementary rather than antithetical to contextualist approaches.
4. A guiding interest in cognitive procedures demands rather than forecloses the acknowledgment of the emotive aspect of rationality and the affective dimensions of literary response.
5. The fantastic or 'off-line' character of fictional representations is constantly kept sight of by cognitive critics, who do not expect fictive scenarios and behaviors to directly model their counterparts in the lived world. At the same time, fictionality is itself seen as context dependent: what is fictional in one setting may be doctrinal (or ideological) in another (Spolsky, 'Why and How').
6. Cognitive criticism also rejects naive realism. It refuses to dismiss (for example) important twentieth-century avant-garde traditions as unnatural or misguided, but rather seeks to understand their appeal to serious artists and informed audiences. Nor does it typically designate certain forms of literary activity (such as metrical verse) as 'natural' and normative in order to devalue others (such as free verse). These are crucial factors in distinguishing cognitive criticism from (much extant) evolutionary literary theory.

Despite this significant area of common ground, however, critics pursuing cognitive approaches to literary criticism and theory need to keep sight of their differences as well – if only to help keep one another honest. Empirical researchers will need to ask themselves whether the constraints of particular study designs and the artificiality of laboratory reading experiments screen out precisely the complexities and nuances that other cognitive critics seek to investigate in their more speculative studies. The more speculative critics, for their part, might want to avoid empirical claims altogether or better learn from the experimentalists how to put their claims to the test. In any case, the value of trained introspection and informed intuition should not be minimized. Nor should the value of disciplinary expertise. Cognitive critics working on narrative, for example, need to actively pursue dialogue with narratologists. Rhetoric, poetics, and reader esthetics all have rich disciplinary histories that must be kept sight of if cognitive critics wish to avoid repeating the mistakes or restating the truisms of their fields.

A special area of disagreement concerns the relation between cognitive literary criticism and the currently dominant poststructuralist theories that cognitive critics variously seek to refute, displace, or build upon. The work of Spolsky, Hart, and Crane has notably demonstrated the advantages – in theoretical sophistication as well as rhetorical suasion – of selectively incorporating insights garnered from several decades of literary theory rather than dismissing a generation of important work wholesale. Their recognition of the sociocultural embeddedness of literary texts, analyzed in terms familiar from materialist, new historicist, and feminist studies, balances and in some cases actually enables their discrimination of the common, invariant, or near-universal cognitive capacities and procedures that make enculturation possible in the first place. A comparable impulse lies behind the growing attention paid by cognitive critics to the ideological functioning of literary texts and the pragmatics and communicative dimensions of literary language.[16] Those studying the 'prehistory' of cognitive science in literary, philosophical, and scientific representations of mind and brain have brought a related (new) historicist attention to ideology and discursive exchange to bear on a subject area made newly visible by the recent surge of interest in embodied, brain-based, and materialist theories of subjectivity. A wide array of scholars and researchers can make common cause in developing a cognitive criticism that remains in touch with cultural studies and ideological critique, while seeking to account for the structure and functions of literary and narrative texts in all their complexity.

Notes

1 For background, see Mary Crane and Alan Richardson, 'Literary Studies and Cognitive Science: Toward a New Interdisciplinarity,' *Mosaic* 32 (1999): 123-40.

2 The petition text for the MLA Discussion Group on Cognitive Approaches to Literature is currently available online at: http://www.bc.edu/~richarad/lcb/fea/pet.html.

3 By 1960, motivated in part by his interest in 'sound symbolism,' Roman Jakobson had already proposed 'codified contiguity' as a preferable alternative to 'arbitrariness' for describing the signifier/signified relation (372).

4 For an overview of cognitive work in developmental psychology, see Gopnik et al.

5 A regularly updated bibliography of relevant work can be found on the 'Literature, Cognition, & the Brain' webpage: http://www2.bc.edu/~richarad/lcb/bib/annot.html.

6 My use of 'soft' categories is in keeping with cognitive categorization theories: see Taylor for an overview.

7 For their most recent overview of cognitive linguistics, with a helpful bibliography organized by subfield, see Lakoff and Johnson.

8 The work of Hobbs and Schank is especially relevant.

9 For a diverse set of essays that offer new applications (and in some cases, original critiques) of conceptual metaphor and blending theory, see Hardy.

10 Some cognitive psychologists, however, have been working experimentally to demonstrate (or qualify) tenets of cognitive linguistics: see especially Gibbs, *Poetics of Mind*.

11 As I have noted elsewhere (Crane and Richardson 133), Frederick Turner, an early proponent of evolutionary theories of culture, independently developed a 'universal' theory of the poetic line comparable to (though less nuanced than) Tsur's (F. Turner 61-108).

12 Semir Zeki, for example, concedes that 'there is . . . a vast area about art which a subject that is as much in its infancy as neurology has nothing to say about,' although (he adds), 'that does not consitute a good reason for not trying to make a beginning in this direction' (1).

13 For explicit critiques of these tendencies within evolutionary psychology, see Spolsky, 'Why and How,' Richardson, 'Rethinking,' and Hogan, *Cognitive Science*, 191-202.

14 More recently, Spolsky has contributed original cognitive readings of works by Shakespeare, Sidney, and other early modern writers and artists in *Satisfying Skepticism* and in this volume.

15 See the concluding sections of the earlier surveys of cognitive criticism by Bizup and Kintgen, Richardson ('Cognitive Science'), and Jackson. I have drawn on all of the above in the present essay.

16 For important recent work on literature, cognition, and ideology, see Steen, 'The Politics of Love,' Zunshine, 'Rhetoric, Cognition, and Ideology in A. L. Barbauld's Hymns in Prose for Children (1781),' and Patrick Hogan's essay in this volume.

References

Abelson, Robert P. 'Artificial Intelligence and Literary Appreciation: How Big Is the Gap?' In *Literary Discourse: Aspects of Cognitive and Social Psychological Approaches*, ed. László Halász. Berlin: de Gruyter, 1987. 38-48.

Beaugrande, Robert de. 'Schemas for Literary Communication.' *Literary Discourse: Aspects of Cognitive and Social Psychological Approaches*, ed. László Halász. Berlin: de Gruyter, 1987. 49-99.

Bizup, Joseph M. and Eugene R. Kintgen. 'The Cognitive Paradigm in Literary Studies.' *College English* 55 (1993): 841-57.

Brooks, Peter. 'Aesthetics and Ideology: What Happened to Poetics?' In *Aesthetics and Ideology*, ed. George Levine. New Brunswick: Rutgers UP, 1994. 153-67.

Carroll, Joseph. 'The Deep Structure of Literary Representations.' *Evolution and Human Behavior* 20 (1999): 161-73.

———. *Evolution and Literary Theory*. Columbia: University of Missouri Press, 1995.

Cooke, Brett, 'Biopoetics: The New Synthesis.' In *Biopoetics: Evolutionary Explorations in the Arts*, ed. Cooke and Frederick Turner. Lexington: ICUS, 1999. 3-25.

Crane, Mary Thomas. *Shakespeare's Brain: Reading with Cognitive Theory*. Princeton: Princeton University Press, 2000.

——— and Alan Richardson. 'Literary Studies and Cognitive Science: Toward a New Interdisciplinarity.' *Mosaic* 32 (1999): 123-40.

Damasio, Antonio. *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: Avon, 1994.

Dissanayake, Ellen. *Art and Intimacy: How the Arts Began*. Seattle: University of Washington Press, 2000.

Easterlin, Nancy. 'Do Cognitive Predispositions Predict or Determine Literary Value Judgments? Narrativity, Plot, and Aesthetics.' In *Biopoetics: Evolutionary Explorations in the Arts*, ed. Cooke and Frederick Turner. Lexington: ICUS, 1999. 241-61.

———. 'Psychoanalysis and 'The Discipline of Love.' *Philosophy and Literature* 24 (2000): 261-79.

———. 'Voyages in the Verbal Universe: The Role of Speculation in Darwinian Literary Criticism.' *Interdisciplinary Literary Studies* 2 (2001): 59-73.

Edelman, Gerald. *Bright Air, Brilliant Fire: On the Matter of Mind*. New York: Basic Books, 1993.

Esrock, Ellen J. *The Reader's Eye: Visual Imaging as Reader Response*. Baltimore: Johns Hopkins University Press, 1994.

Freeman, Donald C. '"Catch[ing] the nearest way": Macbeth and Cognitive Metaphor.' *Journal of Pragmatics* 24 (1995): 689-708.

Freeman, Margaret. 'Metaphor Making Meaning: Dickinson's Conceptual Universe.' *Journal of Pragmatics* 24 (1995): 643-66.

———. 'Poetry and the Scope of Metaphor: Toward a Cognitive Theory of Literature.' In *Metaphor and Metonymy at the Crossroads: A Cognitive Perspective*, ed. Antonio Barcelona. Berlin: de Gruyter, 2000. 253-81.

Fuss, Diana. *Essentially Speaking: Feminism, Nature, and Difference*. New York: Routledge, 1989.

Gardner, Howard. *The Mind's New Science: A History of the Cognitive Revolution*. New York: Basic Books, 1985.

Gibbs, Raymond W., Jr. *The Poetics of Mind: Figurative Thought, Language, and Understanding*. Cambridge: Cambridge University Press, 1994.

———. 'Taking Metaphor out of Our Heads and Putting It into the Cultural World.' In *Metaphor in Cognitive Linguistics: Selected Papers from the Fifth International Cognitive Linguistics Conference, Amsterdam, July 1997*, ed. Raymond W. Gibbs, Jr. and Gerard J. Steen. Amsterdam: Benjamins, 1999. 145-66.

Gopnik, Alison, Andrew N. Meltzoff, and Patricia K. Kuhl. *The Scientist in the Crib: Minds, Brains, and How Children Learn*. New York: William Morrow, 1999.
Grady, Joseph E., Todd Oakley, and Seana Coulson. 'Blending and Metaphor.' In *Metaphor in Cognitive Linguistics: Selected Papers from the Fifth International Cognitive Linguistics Conference, Amsterdam, July 1997*, ed. Raymond W. Gibbs, Jr. and Gerard J. Steen. Amsterdam: Benjamins, 1999. 101-24.
Hardy, Donald, editor. *Cognitive Approaches to Figurative Language*. A special issue. *Style* 36:3 (2002).
Hart, F. Elizabeth. 'Cognitive Linguistics: The Experiential Dynamics of Metaphor.' *Mosaic* 28 (1995): 1-23.
———. 'Matter, System, and Early Modern Studies: Outlines for a Materialist Linguistics.' *Configurations* 6 (1998): 311-43.
Herman, David. 'Parables of Narrative Imagining.' *Diacritics* 29 (1999): 20-36.
———. 'Scripts, Sequences, and Stories: Elements of a Postclassical Narratology.' *PMLA* 112 (1997): 1046-59.
Herman, Vimala. 'Deictic Projection and Conceptual Blending in Epistolarity.' *Poetics Today* 20 (1999): 523-41.
Hernadi, Paul and Francis Steen. 'The Tropical Landscapes of Proverbia: A Cross-Disciplinary Travelogue.' *Style* 33 (1999): 1-20.
Hobbs, Jerry. *Literature and Cognition*. Stanford: Center for the Study of Language and Information, 1990.
Hogan, Patrick Colm. *Cognitive Science, Literature, and the Arts: A Guide for Humanists*. New York: Routledge Press (forthcoming).
———. 'Literary Universals.' *Poetics Today* 18:2 (1997): 223-49.
Holland, Norman N. *The Brain of Robert Frost*. New York: Routledge, 1988.
Jackson, Tony. 'Questioning Interdisciplinarity: Cognitive Science, Evolutionary Psychology, and Literary Criticism.' *Poetics Today* 21 (2000): 319-47.
Jahn, Manfred. 'Frames, Preferences, and the Reading of Third-Person Narratives: Towards a Cognitive Narratology.' *Poetics Today* 18 (1997): 441-68.
———. '"Speak, friend, and enter": Garden Paths, Artificial Intelligence, and Cognitive Narratology.' *Narratologies: New Perspectives on Narrative Analysis*, ed. David Herman. Columbus: Ohio State University Press, 1999. 167-94.
Jakobson, Roman. 'Closing Statement: Linguistics and Poetics.' *Style in Language*, ed. Thomas A. Sebeok. Cambridge: MIT Press, 1960. 350-77.
Lakoff, George and Mark Johnson. *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books, 1999.
Miall, David S. 'Anticipation and Feeling in Literary Response: A Neuropsychological Perspective.' *Poetics* 23 (1995): 275-98.
——— and Don Kuiken. 'The Form of Reading: Empirical Studies of Literariness.' *Poetics* 25 (1998): 327-341.
Oakley, Todd. 'Conceptual Blending, Narrative Discourse, and Rhetoric.' *Cognitive Linguistics* 9 (1998): 321-60.
Ramachandran, V. S. and Sandra Blakeslee. *Phantoms in the Brain: Probing the Mysteries of the Human Mind*. New York: William Morrow, 1998.
Richardson, Alan. 'Cognitive Science and the Future of Literary Studies.' *Philosophy and Literature* 23 (1999): 157-73.
———. 'Coleridge and the Dream of an Embodied Mind.' *Romanticism* 5 (1999): 1-25.
———. 'Rethinking Romantic Incest: Human Universals, Literary Representation, and the Biology of Mind.' *New Literary History* 31:3 (2000): 553-72.

——— and Francis F. Steen. 'Introduction: Literature and the Cognitive Revolution.' *Poetics Today* 23 (2002): 1-8).
Scarry, Elaine. *Dreaming by the Book*. New York: Farrar, Strauss, and Giroux, 1999.
Schank, Roger C. *Tell Me a Story: Narrative and Intelligence*. Evanston: Northwestern University Press, 1995.
Spolsky, Ellen. *Gaps in Nature: Literary Interpretation and the Modular Mind*. Albany: State University of New York Press, 1993.
———. *Satisfying Skepticism: Embodied Knowledge in the Early Modern World*. Aldershot: Ashgate, 2001.
———. 'Why and How to Take the Fruit and Leave the Chaff.' *SubStance* 30 (2001): 177-98.
Steen, Francis F. 'Grasping Philosophy by the Roots.' *Philosophy and Literature* 24 (2000): 197-203.
———. 'The Politics of Love: Propaganda and Structural Learning in Aphra Behn's Love-Letters Between a Nobleman and His Sister,' *Poetics Today* 23 (2002): 91-122.
Storey, Robert. *Mimesis and the Human Animal: On the Biogenetic Foundations of Literary Representation*. Evanston: Northwestern University Press, 1996.
Sutton, John. *Philosophy and Memory Traces: Descartes to Connectionism*. Cambridge: Cambridge University Press, 1998
Taylor, John R. *Linguistic Categorization: Prototypes in Linguistic Theory*. 2nd ed. Oxford: Clarendon Press, 1995.
Tsur, Reuven. *Poetic Rhythm: Structure and Performance*. Berne: Peter Lang, 1998.
———. *Toward a Theory of Cognitive Poetics* Amsterdam: North-Holland, 1992.
———. *What Makes Sound Patterns Expressive: The Poetic Mode of Speech Perception*. Durham: Duke University Press, 1992.
Turner, Frederick. *Natural Classicism: Essays on Literature and Science*. New York: Paragon House, 1985.
Turner, Mark. *Death Is the Mother of Beauty: Mind, Metaphors, and Criticism*. Chicago: University of Chicago Press, 1987.
———. *The Literary Mind*. New York: Oxford University Press, 1996.
———. *Reading Minds: The Study of English in the Age of Cognitive Science*. Princeton: Princeton University Press, 1991.
——— and Gilles Fauconnier. 'A Mechanism of Creativity.' *Poetics Today* 20 (1999): 397-418.
Zeki, Semir. *Inner Vision: An Exploration of Art and the Brain*. Oxford: Oxford University Press, 1999.
Zunshine, Lisa. 'Rhetoric, Cognition, and Ideology in A. L. Barbauld's Hymns in Prose for Children (1781),' *Poetics Today* 23 (2002): 123-40.