Oxford Handbook of

Evolutionary Psychology

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OXFORD
UNIVERSITY PRESS

2007

CHAPTER 44

Evolutionary approache[s] to literature and drama

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44.1. The philosophical orientation of adaptationist literary study

Adaptationist literary study has emerged as a distinct movement only in the past 15 years. Contributors include both literary scholars who have assimilated the ideas of evolutionary psychology and also evolutionary social scientists who have taken literary works as a subject of study. Contributors from both disciplinary fields have appeared together in symposia, conference panels, special issues of journals, and edited books, and they have also entered together into collaborative research projects. This blurring and crossing of disciplinary boundaries points to the largest philosophical principle that distinguishes Darwinian literary study—the idea of 'consilience'. Reintroduced into philosophical parlance by Edward O. Wilson (1998), the term 'consilience' denotes that nature forms a unified field of determinate causal relations and that all fields of knowledge are thus integrally connected. Within the consilient world view, physics constrains chemistry; chemistry constrains biology; biology constrains psychology, anthropology, and the other human sciences, and all these sciences constrain the study of human cultural production, including literature, drama, and the other arts.

Adaptationist literary scholars iden[t]... tion as a crucial link in a causal chain... duces literary artefacts. They accept the... that over evolutionary time the hun... has evolved in an adaptive relationshi[p]... environment, and they affirm that th[e]... mind' has a definite structure—a... configured set of species-typical be[havioural]... dispositions. The common designatio[n]... species-typical configuration—both i[n]... tradition and in evolutionary psych[ology]... 'human nature'. Like most tradition[al]... theorists, adaptationist literary scholars... literary works are produced and con[sumed]... fulfil the needs of human nature, that t[h]... human nature, and that they are const[rained]... their formal organization, by the speci[es]... dynamics of human social interaction.

In the following three sections I shall... the historical context of adaptationis[t]... study, survey the work that has alre[ady]... published in adaptationist literary stu[dy]... then consider some of the direction[s]... research might take.

44.2. The historical conte[xt] of adaptationist literary st[udy]

Literature did not become the subject o[f]... demic discipline until the last two decad[es]...

nineteenth century, and until the 1940s, it consisted in two main forms: (i) philological and historical scholarship; and (ii) moralized aesthetic commentary of a very general, impressionistic character (see Graff, 1987; Abrams, 1997). In the 1930s, a new methodology arose, a form of 'close reading' or formal analysis of theme, tone, and style. 'The New Criticism', as this school is still called, dominated academic literary study in England and America until the late 1970s. By focusing on formal analysis, the school provided a methodology admirably suited to classroom study and to the mass production of scholarly publication in the burgeoning industry of higher education.

Between the middle of the 1970s and the middle of the 1980s, a revolution took place in literary studies. 'Poststructuralism' or 'postmodernism', spearheaded by the 'deconstructive' philosophy of Jacques Derrida, swept across the landscape of literature departments and infiltrated all the departments of the humanities. The fundamental tenets of poststructuralism are 'textualism' and 'indeterminacy'. Textualism is the belief that language or 'discourse' is the elemental stuff of existence, that it constitutes or at least fundamentally determines all forms of reality. Indeterminacy is the belief that all meaning contradicts itself and that no determinate meaning is possible. If all meaning is indeterminate, all texts are open to perpetual reinterpretation. In postmodern essays, this particular inference, though it sounds fairly determinate, has itself been explicitly reiterated with the monotonous regularity of a monastic liturgy. Given that literary scholars deal with a finite body of texts, the motivating force that attaches to this industrial academic rationale can hardly be overestimated.

New Criticism was fundamentally conservative in orientation. Its practitioners were often politically or ideologically conservative, and it shared with Victorian humanism a reverential attitude towards the canonical texts of Western culture—and by extension, towards Western culture itself. The ideological impulses that animated the postmodern revolution were, in contrast, radical and subversive. Under the aegis of Michel Foucault, the postmodernists adopted a stance of suspicion and hostility to all established forms of 'power': bourgeois, patriarchal, heterosexist, Western, colonial, white, rational, and scientific. In the past decade, 'deep ecology' has added one more item to this list of suspect epithets, the anthropocentric emphasis on the specifically 'human' (see Carroll, 2004, Part 1, Chapter 8). Since the middle of the 1980s, the bulk of postmodern criticism has had a political slant, and much of it has been predominantly political. Feminism emerged in the 1970s, independently of postmodernism, as a highly politicized literary movement driven by the transformation of women's social roles and by the changing demographics of the university itself. By the middle of the 1980s, literary feminism had assimilated itself to the larger postmodern creed, and almost all literary feminism now adopts one or another of the postmodern idioms as the medium for its preoccupation with the concerns of women. In the postmodern political arena, textualism and indeterminacy serve as means for deprecating the legitimacy of dominant social, psychological, or sexual norms. Postmodern science theory treats of science itself as merely a political and cultural construct that reflects and supports these dominant norms (Gross and Levitt, 1994; Sokal, 1996; Gross *et al.*, 1997; Koertge, 1998; Sokal and Bricmont, 1998; Parsons, 2003).

Until the advent of postmodernism, academic literary study and standard social science ran on separate but parallel tracks. Darwinian influences on anthropology, psychology and sociology died out in the first two decades of the twentieth century and were replaced by the doctrines of cultural autonomy and behaviourist conditioning (see Brown, 1991, pp. 1–38; Buss, 1999, Part 1; Degler, 1991; Fox, 1989, Chapters 3 and 4; Freeman, 1992, 1999, pp. 17–27; Tooby and Cosmides, 1992, p. 28). From the 1940s to the middle of the 1970s, the New Critical orthodoxy held that literary meaning is itself autonomous and fully intelligible without reference to any contextual influence. The social scientists wished to protect culture from any suspicion of biological influence, and the literary critics wished to protect literature from any suspicion not only of biological influence but also of social influence. Postmodernism expanded the notion of textual autonomy to include not just the isolated literary text but the whole textual universe—the world constituted by 'discourse'. The idea of cultural autonomy brought the postmodernists into

alignment with important aspects of standard social science, and in the 1990s postmodernism began to seep over into anthropology. Much standard social science remains distinct from postmodernism in that standard social scientists, though they reject the idea of human nature and deny that biology influences culture, none the less continue to regard scientific methodology as a medium of objective knowledge about a real world that exists independently of cultural and linguistic constructs.

Adaptationist literary theorists have rejected both the irrationalism of postmodernism and the blank-slate model of human behaviour that informs standard social science. They affirm the ideas of 'truth' and 'reality', and they think that in studying the products of the human imagination, truth and reality can be most adequately served by an adaptationist understanding of human nature.

44.3. Contributions to adaptationist literary study

Literary study inspired by adaptationist social science can be grouped into six large, partially overlapping categories: (i) general programmatic expositions, manifestos and prolegomena; (ii) commentaries on the relation of adaptationist literary study to the bordering fields of ecological literary criticism and cognitive rhetoric; (iii) discussions of the adaptive function of literature; (iv) essays on topics of literary theory (genre, evaluation, and point of view); (v) critiques of specific literary works; and (vi) studies that not only assimilate concepts from the social sciences but also incorporate empirical methodology in the study of literature.

Programmatic expositions rehearse the basic logic of an adaptationist understanding of human nature, affirm that literary production falls within the scope of that logic, and suggest ways in which literary scholars can use evolutionary psychology as a theoretical foundation for literary study (Easterlin, 1993, 1999b, 2001b; Storey, 1993, 1996; Barrow, 1995; Carroll, 1995, 2004, Part 2, Chapters 1 and 6; Carroll, 2005; Boyd, 1998, 2005a; Evans, 1998; Cooke, 1999b; Nieves, 2001; Barash and Barash, 2002, 2005; Fromm 2003a,b; Gottschall and Wilson, 2005; Headlam Wells and McFadden, in press; McEwan, 2005). programmatic expositions have focused ‹ 'consilient' or comprehensively interdiscip nature of adaptationist literary study (C 2004, Part 1, Chapter 7; Gottschall, 2003c; 1999a,b; Nordlund, 2002). Other expos have used evolutionary psychology as a f work within which to criticize the post turalist conceptions that currently dor academic literary study (Carroll, 1995, Part 1, Chapters 2 and 3, and in press d; S 1996; D. S. Wilson, 2005). Within the li poststructuralist paradigm, psychology predominantly Freudian, and some adapta scholars have used evolutionary psychol and especially findings on incest avoida to criticize Freudian literary theory (S 1996; Easterlin, 2000; Scalise Sugiyama, 2 Evans, 2005).

Over the past two decades or so, in ro the same period that adaptationist literary has been developing, literary study ha extended itself into the bordering are cognitive science and ecology. 'Cognitive rh and 'ecocriticism' share little in the way of co or concerns with one another, but both o in some measure, at different points, with tationist literary study.

In its broadest reaches, cognitive rhetori cerns itself with brain functions and wi emotions involved in literary productio response, but as a distinct school of literar ory it affiliates itself primarily with the ling theories of Mark Johnson and George L Johnson and Lakoff argue that language is on metaphor and that metaphors often ‹ from 'the body', but unlike adaptationist c cognitive rhetoricians do not attempt to id a species-typical structure of behav dispositions. Cognitive rhetoricians are g ally hostile to evolutionary psychology some adaptationist critics have criticized c tive rhetoric for the limitations in its conc scope (Carroll, 2004, Part 1, Chapter 5, pp. 5 Part 2, Chapter 1, pp. 104–106; Carroll, p. 938; Gottschall, 2004). Other adaptat critics have sought to identify common gr between cognitive rhetoric and adaptat criticism (Boyd, 1999; Easterlin, 2002).

Ecocriticism is not so much a distinct bc theory or method as, rather, a subject m

Ecocritics have for the most part been animated by environmentalist concerns and sympathies. As specifically literary critics, they have concentrated heavily on a distinct tradition of 'nature' writing, most often American writing. In their theoretical orientation, ecocritics range from postmodernism to a strongly naturalistic and Darwinian outlook. Two prominent ecocritics, Glen Love and Harold Fromm, have sought to assimilate the topics and concerns of ecology to an adaptationist framework (Fromm, 1996, 1998, 2001; Love 1999a,b, 2003). Carroll and Easterlin criticize ecocriticism from an adaptationist perspective and argue that a concept of human nature must take the central place in any theory about the relations of human beings to their physical environment (Carroll, 2004, Part 1, Chapter 8; Part 2, Chapter 4; Easterlin, 2004).

Arguments about the adaptive function of literature fall into three main groups: (i) that literature and the other arts are not adaptive but are, rather, non-adaptive side-effects of cognitive capacities that have developed for adaptive reasons; (ii) that literature and the other arts are indirectly adaptive in that they can be made to contribute to one or another adaptively useful activity; and (iii) that literature and the other arts fulfil adaptive functions that are peculiar to themselves and that could be fulfilled by no other means. Pinker (1997, 2002) argues that the arts, like pornography and rich foods, are means for exploiting psychological mechanisms that evolved for other purposes. He also argues that literature can be adaptively useful in presenting models of situations in which its readers might at some point find themselves. Scalise Sugiyama (2001a) argues that literature can convey adaptively useful information about the environment—specific, concrete information about material resources and physical conditions. Coe (2003) argues that in ancestral environments visual art conveyed information about kin relations. Miller (1999, 2000), Power (1999) and Voland (2003) argue that literature and the other arts, like all other forms of mental activity, subserve the purposes of sexual display. From this perspective, art has no intrinsic adaptive functions but is indirectly adaptive in that, like the peacock's tail, it contributes to processes of sexual selection. Dissanayake, Cooke, and Boyd argue that art evolved as a means of focusing attention on adaptively salient concerns, and Dissanayake, Boyd, and Dunbar emphasize the utility of literature and the other arts in creating and reinforcing social bonds (Boyd, 2005b; Cooke, 1999a; Dissanayake, 1995a,b, 2000, 2001; Dunbar, 2004, 2005). Dissanayake, Cooke, and Boyd emphasize the adaptively relevant content of art. Dunbar concentrates attention on theory of mind or perspective-taking as central mechanisms of human social interaction. E. O. Wilson, Carroll, and Tooby and Cosmides argue that the arts serve a unique adaptive function in that they provide an emotionally saturated cognitive order that mediates between innate dispositions and the complexities of contingent circumstances (Carroll, 2004, Part 1, Chapters 6 and 7; Part 2, Chapter 6, and in press a and c; Tooby and Cosmides, 2001; E. O. Wilson, 1998, pp. 225–26). Tooby and Cosmides converge with Pinker and Scalise Sugiyama in arguing that in listening to stories people rehearse adaptively relevant scenarios. Carroll acknowledges this practical function but also stipulates that the larger adaptive function is not merely practical. Literature and its oral antecedents create models or images of people acting in the world; those models are imbued with emotion and moral value; and they thus provide general psychological maps or guides through which people assess motives and behaviour and evaluate alternatives. In comparison with that of other animals, even other primates, the human cognitive universe is exceptionally complex, and so far as we know humans are unique in creating an imaginative universe and in regulating their behaviour in relation to the imaginative models they construct.

Genre is a composite concept in literary theory, consisting of various proportions of three chief elements: emotional quality, subject matter, and formal organization. The primary emotional component is a polarity between sadness or grief (tragedy) and joy or mirth (comedy). This polarity is compounded by the kind of mirth that involves ridicule or mockery and that produces satire. Storey (1996) and Nettle (2005a,b) have explored the polarity of tragedy and comedy in adaptationist terms, and Storey and Boyd have explored the theory of humour (Boyd, in press b; Storey, 2001, 2003). Storey locates the source of tragedy in struggles over power, and he locates a primate source for comedy in 'the relaxed open mouth display'. Nettle associates tragedy with conflicts over status, and he associates comedy with mate selection. Carroll (2004, pp. 127, 158) correlates tragedy, comedy, and satire with the 'basic emotions' of Ekman 2003, who correlates tragedy with sadness, fear, and anger, comedy with joy and surprise, and satire with anger, disgust, and contempt. Cooke (2002) has examined a specific form of satire, that of the dystopian political novel, and he argues that the satire depends crucially on contrasting the social conditions of a totalitarian state with the evolved needs of a universal human nature. Cooke (1994, 1996) has also examined a generic category, science fiction, that is based more on subject matter than on emotional quality, and he locates the central themes of science fiction in the core issues of survival and reproductive success. Evolutionary psychologists have used mate selection theory to explain the generic features of pornography and romance fiction, paired off, respectively, as male and female forms of fantasy (Ellis and Symons, 1990; Whissel, 1996; Salmon and Symons, 2001; Salmon, 2005). The largest formal distinctions are those between drama, narrative fiction, and poetic verse. Turner (1992, pp. 61–108) has examined the biological basis of poetic meter; he argues for a biologically based three-second metric. Scalise Sugiyama (1996, 2001b, 2005) and Steen (2005) both identify the core elements of narrative as those of goal-oriented agents coping with the adaptive problems of resources and social life. Nettle (2005b) creates a typology of drama through the intersection of two central conflicts (status and mating) and two possible outcomes (negative and positive). Three studies have examined the correlation between the sizes of human social groups and the formal organization of dramas (Stiller *et al.*, 2004; Matthews and Barrett, 2005; Stiller and Hudson, 2005). These studies are oriented to a model for the evolution of the human brain that is driven by social group size, and they use anthropological data on social group size to analyse the organization of social groups in the populations of specific plays and genres.

Adaptationist discussions of literary value, like adaptationist critiques of literary depictions, have tended to focus on the issue of human universals. Turner (1992, p. 26) identifies literary merit with

the sheer number of universal them given work. Cooke (1999b, p. 55) assc erary merit with the presence of confli biologically based dispositions. Easterli 2005) counters the emphasis on uni drawing attention to the way element ary tradition and other culturally co factors enter into judgements of liter Carroll (2004, p. 145) argues that ju of value typically depend on a combi factors: elemental motives linked w emotions, coherent thematic structure felicity, and the quality of mind and he writer. He also invokes a principle of ' in the conception of a subject and in th organization of a literary work (Carr Part 2, Chapter 5).

Point of view is a standard technica literary narrative and involves distinct those between 'first-person narrator', 'thir omniscient narrator', 'third-person narrator', and so on. In its broader signi the concept of 'point of view' opens anthropological and psychological th literature as a social and communica Dunbar, Barrett and Lycett argue that th tion of specifically human sociality is dependent both on language and on th ity for empathy or 'theory of mind', th capacity to envision the world from s else's point of view—to intuit another perceptions, thoughts, and beliefs (Barr 2002, Chapters 11, 12 and 13; Dunba 2005; Dunbar *et al.*, 2005, Chapters 8, 9 Scalise Sugiyama (1996) examines the narratives are shaped to manipulate au in the interest of the narrator. Carroll that literary meaning emerges thro negotiation among three distinct sets of view: that of the author, of the charact of the audience. Since point of view i individual identity, Carroll argues that theory needs to make use of an emp derived set of categories, including th personality theory, for analysing ind differences (Carroll, 2004, Part 2, Cha and 6; 2005, and in press d).

A large portion of the work done in a tionist literary study has consisted in in tive commentary on specific literary text characteristically, these commentaries i

behaviours in the texts that correspond (or fail to correspond) to species-typical patterns of behaviour. Topics have included all the standard categories in which evolutionary psychologists tend to divide human life-history effort: survival, resource acquisition, mate selection, parenting, childhood development, kin relations, and social life, including status seeking, coalition building, cheater detection, and in-groups and out-groups. The most sophisticated of these interpretive commentaries have analysed the interplay between elemental dispositions and particular social and cultural ecologies, and they have also incorporated the concepts of traditional literary analysis: the analysis of style and tone, symbolism, figures of speech, point of view, narrative and dramatic structure, the interplay with audience expectations, and the problems of literary value.

The curricula of departments of literature are commonly organized by period and genre, and those categories will serve here as a framework for outlining adaptationist contributions to interpretive criticism.

One distinct generic group consists in studies of folk tales, fairy tales, fantasies, and works of science fiction. Cooke (1995) and Easterlin (2001a) have examined specific fairy tales. Jobling (2001b) gives a generalized account of ogre stories. (Gottschall has compared large numbers of fairy tales from different cultures; these studies will be cited below under the category of empirical literary analysis.) In all of these studies, emphasis is given to the way in which the stories embody universal themes grounded in evolved psychology. Other critics have examined works in which symbols of human universals are lodged within highly specific cultural or ecological conditions. Boyd (2001) gives an extensive critique of a fantasy tale by Dr Seuss and takes it as a critique of American xenophobia. Cooke has delved into futuristic science fiction (1987, 2002) and has also given a book-length critique of a single literary work, Zamyatin's dystopian futuristic fantasy *We* (Cooke, 2002). He locates this novel within the larger contexts of dystopian fiction and Soviet literature and takes evolutionary psychology as an implicit satiric frame for Soviet totalitarianism. Carroll critiques three works of paleo-fiction (2004, Part 2, Chapter 5) in which Neanderthals and Cro-Magnons encounter one another, and he uses the specific conditions of Palaeolithic life as a touchstone for assessing the imaginative quality of the novels.

Epics have received a good deal of attention. Nesse (1995) examines three poetic versions of the Guinevere myth, assessing differences in the sexual ethos of different cultural moments. Thiessen and Umezawa (1998) give a sociobiological reading of a medieval Japanese novel and see in it an exemplification of universal human mating dispositions. Fox (1995, 2005) has used evolutionary findings on mate selection to examine male mating conflict in a number of epics. Gottschall (2001, 2003a) examines the Homeric poems within their anthropological context, using sociobiology as a conceptual frame for understanding the sexual ecology of the poems. Barash and Barash (2002, 2005) comment on Virgil's *Aeneid* in the light of evolved sexual psychology. [Barash and Barash (2005) give brief commentaries on adaptationist themes in dozens of works in world literature from the time of Homer to the twentieth century.]

Shakespeare has been a frequent subject of adaptationist criticism. Stiller, Hudson, Nettle, and Dunbar have taken Shakespeare as a focal point for analysing the correlation between human social-group size and the organization of characters within drama (Stiller *et al.*, 2004; Stiller and Hudson, 2005). (See the comments above on the form of drama.) Nettle's (2005a) analysis of tragedy and comedy illustrates its theory with commentary on *Richard III* and *Twelfth Night*. Boyd (in press a) uses kin selection as a chief category for the analysis of dramatic conflict in *Titus Andronicus*. Nordlund (2005) and Headlam Wells (in press) integrate concepts of an evolved human nature with knowledge of Shakespeare's specific historical environment. Nordlund argues that the romantic love is grounded in evolved psychology, and he takes romantic love as a basis of comparison between *Troilus and Cressida* and *All's Well That Ends Well*. Headlam Wells concentrates on the humanist moral vision in *Twelfth Night*, *The Merchant of Venice*, *Measure for Measure*, *The Winter's Tale*, *Romeo and Juliet*, *Julius Caesar* and *King Lear*. Boyd (1999, 2005a) and Nettle (2005b) take *Hamlet* as the basis for exploring the psychological foundations of drama. Scalise Sugiyama (2003) examines a native African people's response to *Hamlet* and draws important

conclusions about the relations between human universals and culturally specific values and beliefs.

Lyric poetry has received some attention from adaptationist critics. Jobling (2002) discusses Byron as a figure who exemplifies the 'cad' mating strategy. (This study was extended as an empirical study by Kruger *et al.*, 2003.) Easterlin (2000) examines the pervading theme of mother–infant relations in the poetry of Wordsworth, correlates Wordsworth's insights with those of modern attachment theory, and sets both in contrast with an extensive body of Freudian feminist criticism. Evans (in press) has examined poems about sports in the light of evolutionary psychology.

A number of adaptationist critics have given interpretive accounts of narrative fiction of the nineteenth and twentieth centuries. Cooke (1999c, 2002) has studied Slavic subjects, but most contributors have studied topics in British and American fiction. Boyd and Carroll have interpreted works of Jane Austen (Boyd, 1998; Carroll, 2004, Part 2, Chapters 3 and 6), and Carroll has also critiqued works by Dickens, Charlotte Brontë, Cather, Bennett, Hardy, Wilde, and others (2004, Part 1, Chapters 6 and 8, Part 2, Chapters 1 and 3; in press b). Carroll (2004, Part 2, Chapter 3) uses five novels to exemplify different kinds of relations among human universals, culturally specific contexts, and individual identities in authors, and he also invokes human universals as a touchstone for canonical status. Jobling (2001a) and Kruger *et al.* (2003) have studied the novels of Sir Walter Scott from a specifically adaptationist perspective. Jobling uses sociobiological mating and ethical theory to explain the pattern of dark and light heroes in Scott's novels, and Kruger *et al.* use characters from Scott and Byron to test hypotheses about differences in cad/dad mating strategies. Easterlin (2005) gives an account of meta-fictional reworkings of *Jane Eyre* and *David Copperfield*, examining the way universals are altered by the self-reflexive contexts of a literary tradition. Love (2003) comments on novels by Howells, Cather, and Hemingway, locating all these commentaries in relation to ecological constraints within the physical environment. Saunders (2005, and in press) comments on a novel by Wharton and a story by Anderson, in both cases assessing the way the narrative is shaped l underlying, not fully conscious, force evolved sexual psychology. Storey (1996) an a novel by Iris Murdoch and argues Murdoch's conscious Freudian psycholc tacitly subverted by her intuitive apprehe of evolved sexual psychology. Perchan (: examines a novel by Graham Greene in to assess the way in which evolved s psychology shapes interpersonal relatioı exotic conditions. Carroll and Gotts (in press) have used an evolutionary uı standing of motives, mate selection, and peı ality to produce a content analysis of the mo mate preferences, and personality character of 170 characters in 44 British novels oı nineteenth century.

All the theoretical and critical works I cited make use of information derived ſ evolutionary psychology—information th itself derived at least in part from empi research. Another distinct body of v not only makes use of empirically derived in mation but conducts empirical research literature. Miall and Dissanayake (2003) perf metric, phonetic, and foregrounding analys 'motherese' and situate their analysis withir adaptationist theory of mother–infant interact Scalise Sugiyama (2001a) analyses the incide of adaptively relevant information about resou in the narratives of native peoples. D. S. Wil *et al.* (1998) conducted an experiment to as the relation of Machiavellianism to the fictic stories produced by experimental subje Kruger *et al.* (2003) use literary texts to as differences in short and long-term mat strategies in respondents. The studies pornography and romance fiction, cited ab in the paragraph on genre, all make use of qu titative analysis and work with predictic about sex differences in mating psycholc (Ellis and Symons, 1990; Whissel, 1996; Salm and Symons, 2001; Salmon, 2005). The stud that examine the relation between social gro size and dramatic structure, also cited above the paragraph on genre, begin with an empiri analysis of correlations between social gro size and the evolution of the brain, and th bring these findings to bear on analyses of gro sizes in dramatic representations (Stiller *et a* 2004; Matthews and Barrett, 2005; Stiller ar

Hudson, 2005). Gottschall and his colleagues have conducted a series of studies analysing the correlation of species-typical behaviours with representations of behaviour in large numbers of folk tales, fairy tales, and literary works (Gottschall, 2003b, 2005; Carroll and Gottschall, in press; Gottschall *et al.*, 2004, 2005, in press a and b).

44.4. Directions for further research

Most of the research areas outlined above have been explored in only a preliminary fashion. Up to the present time, the only area that has been fully developed is that of programmatic expositions. As both evolutionary psychology and adaptationist literary study develop further, and as the institutional context of literary study changes, it will be necessary periodically to reassess the whole field. For the time being, the most productive efforts could probably be devoted to the other areas under review.

Theories about the adaptive function of literature and the other arts remain in a highly speculative state. The background knowledge for this area—knowledge about the last few hundred thousand years of human evolution, the development of language, the evolution of social life, and the emergence of symbolic culture within the past 100 000 years or so—is itself still speculative and controversial (see Carroll, in press c). Further understanding of this issue will depend in part on developments in the primary field of anthropological research into human evolution and in part on psychological studies of the actual functions that are currently fulfilled by the production and consumption of imaginative artefacts.

Major topics in literary theory have been broached but by no means fully explored by adaptationist scholars. A better understanding of tone and genre will depend in part on a more precise and adequate knowledge of the nature of emotion. Research into 'basic emotions' and affective neuroscience provide chief points of departure for this research. Knowledge of the way 'point of view' enters into literary meaning can be advanced by new findings in theory of mind, in the evolution and nature of human sociality, and in personality. Literary value, like all value, is subjective, but subjective mental events are themselves susceptible to empirical research, and the same kinds of research that illuminate an understanding of emotion, point of view, and social dynamics will further illuminate our understanding of literary values.

The interpretive critique of individual literary works, and of works grouped by author, genre and period, provide a main field for further development in adaptationist literary study. Current studies have made only an occasional lodgement on the coast of a continent in which the interior remains largely unexplored. Vast tracts of world literature, and whole phases even of English and American literature, remain virgin forest. The medieval period has barely been touched, and virtually nothing has been written about seventeenth- and eighteenth-century literature. Scarcely more has been written about modern literature. Most poetry remains to be explored. Apart from the works of Shakespeare, most drama has not yet been brought under scrutiny.

The social sciences are in general not strongly oriented to the study of cultural history. Evolutionary psychology grounds itself in deep history—in evolutionary history—and it is preoccupied with the human universals that emerge from that history, but it has made only rudimentary progress in understanding how universal human dispositions vary in the varying cultural ecologies of the past 10 000 years—the period for the emergence of agriculture, mass societies, and literacy. One of the chief challenges to adaptationist scholars, and one of the chief ways in which they can contribute to the larger project of an adaptationist understanding of human nature, is to integrate a knowledge of species-typical behavioural dispositions with a scholarly knowledge of specific cultural ecologies.

Most literary scholars have not been trained in empirical methodology, and few social scientists have taken literature as a source for data. That disciplinary barrier is now being surmounted, and the new methodologies that are being developed should fundamentally influence every area of literary study. New knowledge produces new concepts, and new concepts alter the terms in which we formulate literary theories and analyse individual texts. By developing quantitative methods of analysis and by using data to test specific hypotheses, literary scholars can produce knowledge that is both falsifiable and genuinely progressive. They can link their own work ever more closely with the continuously developing knowledge in the empirical sciences, and they can produce new knowledge.

A truly adequate form of adaptationist literary study would combine at least four areas of expertise: (i) a thorough knowledge of evolutionary psychology—including a knowledge of its current limitations and its chief topics of controversy; (ii) a deep and broad humanistic training, with specialized knowledge of one or more historical periods, including the demographics, economics, politics, cultural forms, and literary traditions of those periods; (iii) expertise in the methods of 'close reading'—a knowledge of the inner workings of tone, imagery, style, figures of speech, and the formal organization of narrative, drama, and verse; and (iv) a practical acquaintance with empirical methodology and a readiness to incorporate empirical analysis into literary research. Literary scholars will need both to develop new forms of expertise and also to imitate the sciences in the practice of working collaboratively, in research teams, so as to pool different forms of expertise. The demands are heavy, but the rewards great. We have opportunities of discovery that are, in the humanities, unprecedented.

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CHAPTER 45

Music and cognitive evolution

Ian Cross

45.1. Introduction and historical background

In 1858 Herbert Spencer sent Charles Darwin a collection of essays which set out Spencer's thinking on a range of issues (Spencer, 1858), including the "origin and function of music". Darwin responded, thanking Spencer for the present; he congratulated him on the "admirable" nature of his "remarks on the so-called Development Theory", admitting that he himself was presently engaged on "an abstract of a larger work on the change of species", though treating the subject "simply as a naturalist & not from a general point of view; otherwise, in my opinion, your argument could not have been improved on & might have been quoted by me with great advantage". Darwin continued, declaring that "Your article on Music has also interested me much, for I had often thought on the subject & had come to nearly the same conclusion with you, though unable to support the notion in any detail" (Darwin, 1858).

By the time Darwin came to set out his thoughts on music in *The Descent of Man and Selection in Relation to Sex* of 1871 (Darwin, 2004), however, something of a divergence of view had emerged, perhaps partly accelerated by Darwin's increasing exasperation with the extent to which his concept of evolution as founded in natural selection had been confounded in the public mind with the teleological theories propounded by S
In *The Descent*, Darwin suggests that
arose as a functional component of proc
sexual selection; it should be regarded as
been analogous in its utility to the
produced by the males of a wide va
species to attract mates (Darwin instanc
alia, insects, fish, birds, mice and apes)
music is incapable of functioning in th
that "articulate speech" may do, its po
representation being vague, it has great
to arouse in us "various emotions".
affective powers arise through its assc
with processes of sexual selection, being en
"during the season of courtship, when a
of all kinds are excited not only by lo
by the strong passions of jealousy, rival
triumph". Indeed, impassioned speech e
profoundly musical characteristics; as I
puts it, the powers of music are reflected
"cadences of oratory". Music constitutes
for the emergence of language, being a c
widely shared with other animals and cons
a medium ideally suited for the commun
of affect rather than representation. I
thus viewed music as a precursor of lar
its ultimate roots lying in its adaptive v
sexual selection.

Darwin contrasted his views with th
tion of Spencer that he had praised in