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The Multifunctionality of Idle Afternoons
Art and Fiction in Boyd's Vision of Evolution

- Brian Boyd, On the Origin of Stories. Evolution, Cognition, and Fiction. Cambridge, MA / London: The Belknap Press of Harvard University Press 2009. 540 pp. [Price: $ 35.00] ISBN 978-0-6740-3357-3.

Brian Boyd's monumental *On the Origin of Stories* lives up to the promise of its title: it is a comprehensive as well as detailed attempt to reconstruct the evolutionary history of art and fiction, embracing the entire spectrum of art and art-like practices from their scattered phylogenetic antecedents and analogues in both remote and closer related species, to the various manifestations of art and fiction among early humans, to changing forms and functions of stories since the beginnings of the historical record. It may even be the most comprehensive and detailed of all existing attempts to theorize literary phenomena from an evolutionary perspective. Yet, there might be a reason why other attempts in this field have refrained from painting a picture as complete as Boyd has undertaken to present. Boyd achieves his aim only by conceptually binding together many different things. This allows him to state hypotheses that, while potentially valid in one case, pretend validity for all elements of the ›class‹ and thus smooth the way for a Darwinian story of ›origin‹. I believe that Boyd succumbs to the problem of what I would like to call the adaptationization of abstract concepts. The genealogy he constructs does not look very surprising: art derives from play, and fiction, naturally, is a subcategory of art; religion is a descendant of fiction, and play, art, fiction, and religion are, of course, all »adaptations«. I doubt that evolution works in steps which mirror our philosophical classification systems. Despite my reservations about Boyd's overarching theory, however, I must stress at the outset that he makes many convincing, sometimes truly innovative points in the rich detail of his study – even if identifying these points, as we will see, is not a walk in the park for the reader.

The book has two major parts of roughly equal length. In the first 200 pages, Boyd develops his evolutionary-theoretical framework and reconstructs the emergence of art, narrative, and fiction. The last half comprises the extensive study of two literary examples: the *Odyssey* and Dr. Seuss' *Horton Hears a Who!* With introductory and concluding chapters and notes, the study covers about 450 pages, completed by a 50-page bibliography and an index of names and concepts that spans an impressive 30 pages.

Speaking to an audience mainly from the humanities, Boyd wisely begins by refuting a couple of common prejudices against the idea of a universal human nature and the assumptions of evolutionary biology. Not all of these refutations are equally concise in argument, but Boyd usefully recapitulates some basic issues of evolutionary thinking and skillfully avoids the risk of expatiating on ideological debates. As a result, this short first chapter is both informative for the skeptic and not boringly redundant for the already-convinced. For those who would like to know more exactly where in the heterogeneous field of evolutionary criticism, literary Darwinism, and cognitive poetics Boyd positions his own approach, he makes some interesting and insightful remarks about this matter in his »Conclusion«.

Boyd continues by introducing the core conceptions of »evolution«, »adaptation«, »byproduct«, and »function«, and also provides a survey of the emergence and research program of

evolutionary psychology. Intelligence and cooperation, two aspects of particular significance for our species as well as for Boyd's later argument, are granted a more extensive exposition in two separate chapters. This section of the book contains fairly readable (and for the most part[1] reliable and evenhanded) synopses of a huge body of research.

But subsequent chapters, presenting Boyd's own accounts of two significantly human traits, namely art and play, are less well arranged. To a large extent, Boyd leaves it to the reader to reconstruct a precise line of argument from his broad-based discussion of relevant issues. The argumentative structure that Boyd does offer is sometimes misleading. An example is the moment when he generously thanks Steven Pinker for »stating so pungently the hypothesis of art as a byproduct«, because

> the hypothesis fails – and therefore contributes to the case for arts as not a byproduct but an adaptation: *If* art involved no benefit, if it only mimicked biological advantage, as drugs do, by delivering unearned pleasure, *yet* it had high costs in time, energy, and resources, *then* a predisposition to art would be a weakness that would long ago have been weeded out by the intensity of evolutionary competition. (83, emphasis in the original)

This struck me as a multiply flawed attempt at logical refutation. First of all, the failure of Pinker's byproduct hypothesis would necessitate[2] the hypothesis of art as an adaptation only if all the arts were one and the same thing (I shall come back to this point). However, Pinker merely »proposed that many of the arts [!] may have no adaptive function at all.«[3] Second: I think Boyd is correct to state that Pinker's propositions »depend on seeing art as consumption« and he rightly reminds us that »before we respond to art we have to generate it« (82). Pinker's idea of artworks as simply »pressing our pleasure buttons«[4] indeed focuses strongly on certain reception aspects, but for these, at least, Pinker has given a valid evolutionary explanation.[5] Moreover, this explanation can accommodate the long-standing opinion that there is something in art that seems to be for its own sake, ›autonomous‹ and of intrinsic value. Thus, I cannot see any ›failure‹ on Pinker's part. Pinker »successfully explains many features of the arts,« even though »there is much that [he] leaves unexplained,« as John Tooby and

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[1] My hedge here is due to Boyd's assumption that the »leading proponents« of recent sociobiology »have come to accept the need for *multilevel selection theory*« (52, emphasis in the original). This casual remark very elegantly veils the fact that multilevel selection theory (MLST) is by no means the undisputed orthodoxy in current biology. Wilson/Wilson 2007, which is Boyd's general reference in that passage, aims to make MLST, including a revised concept of group selection, more accepted in a discipline in which »it is still common to read in articles and textbooks that group selection is wrong because ›the gene is the fundamental unit of selection‹« (David Sloan Wilson/Edward O. Wilson, Rethinking the Theoretical Foundation of Sociobiology, *The Quarterly Review of Biology* 82 [2007], 328-348, 336). The issues at stake in resolving that controversy require reasoning on a very sophisticated level of evolutionary theory and also having some knowledge of genetics, and it is not my job, as a literary scholar, to decide that case. (Let me note in passing that some of the *applications* of MLST I have seen, like examining the ›reproduction‹ of conservative milieus as compared to liberal ones, really make me worried that MLST is but a carte blanche for a radical biologization of cultural history – by biologists who have apparently never heard of that also well-advanced academic discipline called sociology.) But regardless of whether MLST is right in principle or not, I believe that Boyd is wrong to make an ongoing scientific discussion seem like an established doctrine just because he uses group selection to strengthen his hypothesis of art as an adaptation.

[2] There are three possibilities to classify a given behavior biologically: adaptation, byproduct, genetic noise. Boyd rightly precludes the third possibility for art (cf. 34).

[3] Steven Pinker, Toward a Consilient Study of Literature, *Philosophy and Literature* 31 (2007), 161-177, 171.

[4] Steven Pinker, *How the Mind Works*, London 1999, 525.

[5] Pinker's explanation of such phenomena, by the way, is not at all incompatible with Boyd's own suggestion of art as ›cognitive play with patterns‹. Also later on, when Boyd compares »our sometimes indiscriminate appetite for social information« (producing »an endless fascination with character information«) with »our continued craving for sweet and fat« (165), he comes pretty near to Pinker's idea of the arts as being kind of ›cheesecake for the mind‹.

Leda Cosmides, in a similar approach to that question, much more reasonably put it.[6] So what about the high costs of art that Boyd mentions as counter-evidence? This is going to be my third point.

One of Boyd's major examples of costly art is the ancient Chauvet cave drawings in France. Boyd is to be applauded for taking the time to make his readers seize the significance of these early manifestations of human art by emphasizing that for their creators, these drawings obviously

> seemed worth executing in a site difficult to access but sure of preservation. The wall markings were hardly the casual doodles of idle afternoons. The grotto at Chauvet was no dwelling place, and the drawings were no stone-age wallpaper. This remote cave, deep underground, accessible only by the light of a burning brand or a tallow candle, seems to have been selected precisely for its remoteness from disturbance, whether by weather, plant, or animal, expressly to preserve the art of particularly awe-inspiring craftsmen. (8)

Boyd rightly informs us that »[n]ature selects against a cost without benefit, as when it dispenses with sight in burrowing or cave-dwelling animals« (83). This is one of the evolutionary rules of thumb that productively apply as long as we talk of physical traits and instinctive behavior, that is, evolutionarily ›hard-wired‹ mechanisms shaped by selection. Arguing for a view of ›art as adaptation‹, Boyd obviously does assume that there is an art ›instinct‹, the high costs of which are balanced by the many benefits of art Boyd presents in the later chapters. But let us stop and think about this assumption for a moment.

An alternative explanation would be that art is an eminently *cultural* behavior. I do not mean to advocate a simplistic nature/culture distinction here. Rather I want to emphasize that adaptations are not all we need when explaining human behavior. We also have to take into account the (not specifically adaptive, or even detrimental) side-effects of these adaptations and, more importantly, the *complex cultural combinations* of a multitude of instinctive tendencies and their side-effects. Those combinations were not shaped by natural selection (although they do use a number of biological substrates that were) but rather emerge every now and then in this or that culturally more or less stabilized, conventionalized form. Some of these forms may involve unreasonably high ›costs‹ (and many people in human history have even lost their lives for eminently cultural reasons). However, in order to eliminate those behaviors from the human genetic program, natural selection would have to eliminate the biological substrates and thus also dispense with the adaptive advantages for which these substrates have been selected, and which have obviously been significant enough to outweigh the concomitant (but less stable) negative side-effects from the outset. In that way, evolution simply *tolerates* a lot of potential behaviors that are not themselves adaptive, or even detrimental. Given that Boyd does not mean to advocate a panadaptionist view,[7] he will surely agree with me that there are two theoretically possible answers to the question how art can involve such high costs. Let me show briefly why I prefer the ›cultural‹ explanation over Boyd's adaptationist one.

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[6] John Tooby/Leda Cosmides, Does Beauty Build Adapted Minds? Toward an Evolutionary Theory of Aesthetics, Fiction and the Arts, *SubStance. A Review of Theory and Literary Criticism* 30 (2001), 6-27, 11.

[7] I am unsure about this point, however. Boyd does not disclaim the concept and existence of evolutionary by-products. However, he hardly ever mentions a byproduct in his study without immediately making it the exaptation of another adaptation. This is the normal, and completely correct, procedure for reconstructing (»reverse-engineering«) the multilayered evolutionary history of an adaptation. The problem is, however, that I do not consider all of Boyd's ›adaptations‹ to really be (biological) adaptations. So, this (along with the way he likes to cite Stephen Jay Gould) indeed makes me wonder whether Boyd can think of any kind of behavior that is *not* ›an adaptation‹. The one time he does, he has rather peculiar reasons; cf. note 30.

»Michelangelo's years on his back painting the Sistine Chapel ceiling« (83): did Michelangelo really spend his time that way because evolution explicitly favored people doing such weird things, or because he, for certain socio-cultural reasons, believed in the worth of what he was doing (and also because that was his way to earn a living)? To put it differently: to what extent was Michelangelo's motivation ›instinctively‹ biased – to roughly the same extent to which beavers are instinctively motivated to build dams? Note that this is Boyd's own example. Evolution has engineered the genetic tendency in beavers to build dams; »[l]ikewise«, as Boyd says, it has engineered an »inclination« or »disposition to art« into humans (83). Boyd, too, is of course aware of Michelangelo's socio-cultural motives and this is why Michelangelo is mentioned again, some pages later, as an example of art as »a potent means of earning the currency of status« (111) – one of the many reasons, according to Boyd, art was selected for. Furthermore, what Karl Eibl has dubbed ›secondary severity‹[8], where cultural functions are superimposed upon basically playful (›autonomous‹) behaviors, is by no means missing in Boyd's comprehensive system; but it is, again, shifted to the biological level. The painstaking commitment of the ancient cave painters, of Michelangelo lying on his back, or medieval people building cathedrals (cf. 118), according to Boyd, might be the result of a biological disposition for ›costly rituals‹. Religion, as an adaptation to enhance social cooperation, employs costly – and, for some reason, preferably costly *artful* – signals »as a guarantee of allegiance« (117) and thus, once more, promotes art as an adaptive trait in humans.

By this point, it has become apparent that what Boyd brings to the fore as the many benefits of art are in fact a kind of *fortuitous effect* (to use George Williams' words[9]) that art produces in various contexts, rather than its ›adaptive function(s)‹ per se. And indeed at this point in his exposition Boyd has quietly abandoned that term and has replaced it with less strict ones. After about a hundred pages, he even makes a surprising distinction, saying that one of those many benefits »could become a powerful sustainer of art and indeed perhaps its main *function*, even in strict evolutionary terms« (118, emphasis in the original). Even in strict evolutionary terms? So what language does he think he has been speaking hitherto?

As the above-mentioned byproducts of adaptations include not only neutral or negative but also positive side-effects, there are indeed such things as fortuitous effects in evolutionary history. If a trait which is selected as a successful reply to a specific selection pressure also proves beneficial in many other contexts, this does not make that trait an *adaptation to* those contexts; that is, the other beneficial contexts are not being integrated into the ›hard-wired‹ design as additional triggering mechanisms.[10] However, behaviors involving that trait might unsolicitedly *occur* in these contexts very frequently and, if these contexts are multitudinous, thus make a cluster of interrelated behaviors very typical, almost omnipresent in a species. Behaviors which thusly »exploit«, as Williams said, the »incidental effect[s]« of existent traits,[11] are not the expression of a genetically fixed adaptation specifically designed to fit this plurality of contingent additional contexts, but they may yet be the result of a more general adaptive trait: the inclination to repeat and imitate behaviors that have already proven successful under similar conditions. – In other words, the many (cognitive, physical, perceptual, emotional, etc.) traits involved in artistic behavior all have their own particular origin; they do not

[8] Karl Eibl, Zwei Kulturen? Zwei Denkweisen und ihre biologischen Ursprünge, in: Karl Eibl/Katja Mellmann/Rüdiger Zymner (eds.), *Im Rücken der Kulturen*, Paderborn 2007, 31-48; Karl Eibl, *Kultur als Zwischenwelt. Eine evolutionsbiologische Perspektive*, Frankfurt a. M. 2009, 169-172.

[9] George Williams, *Adaptation and Natural Selection*, Princeton 1966, 4, 261, and passim. – Note that Boyd explicitly cites Williams as authority for his definition of »adaptation«; cf. note 18.

[10] Except in the particular case that it serves as an exaptation for the adaptive reply to another specific selection pressure. But then we also have a second adaptation in its own right, not »different functions [...] at different times« (206) of one and the same adaptation; cf. my following remarks on the analytical term of »adaptation«.

[11] Williams 1966, 13.

become a new adaptation of ›art‹ just because they are *used* in art. Michelangelo is probably not ›*triggered*‹ to artfully paint the ceiling of the Sistine Chapel the way a beaver is triggered to build a dam in a particular set of situational conditions. However, if certain combinations of those many traits are also good means to install and maintain social hierarchies and belief systems, to appease adversaries, attract potential mates, reduce bodily stress,[12] attune group members and deepen social cohesion, – indeed why not *use* these combinations as often as possible? In that way, evolution not only tolerates, but also allows for a stunning overrepresentation of some self-suggesting (albeit unstable) behaviors.

Thus, Boyd's monumental network of the multilayered and mutually enhancing benefits of art ultimately is an unprecedentedly elaborate description of art's earliest history.[13] It shows how that cluster of interrelated behaviors which we today summarize under the abstract notion of ›art‹ could grow to »such a central part of all cultures« (71). My dissent arises solely from the fact that he sees this earliest history of art not as part of a (prehistoric yet still) *cultural* history but as a close-knit net of biological selection processes. On the one hand, he sometimes seems to distinguish what we called fortuitous effects above from the »strict evolutionary terms« of function and adaptation, and after two hundred pages he even very suddenly speaks of »cultural evolution«.[14] On the other hand, he constantly strives to tie down every new benefit as being, indeed, a biologically relevant advantage on the level of group selection.[15] And, what is even more surprising, he underhandedly modifies the evolutionary-theoretical terms to serve his own purpose by repeatedly pointing out that the function of a particular design »need not be a single one« (37, see also 80f. and 113) and thus also enthusiastically anticipating »a plethora of functions« for art (100). This is not standard biology.

The term »adaptation« in evolutionary biology is an *analytical* concept. It signifies a specific design feature in correlation with an equally specific selection pressure which defines its »adaptive value« or »function« (and here theorists use »function« in the singular[16] simply by definition). Thus, »adaptation« refers to units that are not necessarily identical with things as they occur to us in everyday understanding (like ›eyes‹, ›hands‹, ›legs‹[17]), but instead with a

[12] See Karl Eibl, *Animal poeta. Bausteine der biologischen Kultur- und Literaturtheorie*, Paderborn 2004, 312-319. I missed this aspect in Boyd's list of the benefits of art. Maybe the special consideration of such simply ›relaxing‹ effects of art is too Pinkeresque for his taste. But seriously, once we move to the level of the many beneficial *uses* of innate mechanisms, there is no such thing as an exhaustive list.

[13] Cf. his remark that »the history of art runs so deep that it has been engrained in the psyche« (73). The question is, certainly, what »engrained« is supposed to mean. Boyd's conception of art's psychological engrainment obviously goes beyond the idea of just ›self-suggesting (albeit unstable) behaviors‹.

[14] »In the evolution of biological adaptations, different functions may dominate at different times. Bird wings apparently evolved first as thermoregulatory flaps, and can still be used that way, but they much more centrally serve what is now their main function and what has shaped their recent evolution: flight. In the same way, our predisposition to fiction has served different functions at different stages of cultural evolution.« (206)

[15] For the problem of group selection cf. note 1.

[16] Cf. the central »question: ›What is its function?‹« as formulated by Williams 1966, 252. Williams calls for »rigorous criteria for deciding whether a given character is adaptive, and, if so, *to precisely what* it is an adaptation« (4, my emphasis). Accordingly, he repeatedly marks »the mistake of assuming that a beneficial effect is necessarily a function« (146) or »that when one demonstrates that a certain biological process produces a certain benefit, one has demonstrated *the* function, or at least *a* function of the process. This is a serious error« (209, emphasis in the original), because »the demonstration of effects, good or bad, proves nothing. To prove adaptation one must demonstrate a functional design« (212; similarly 261).

[17] Cf. Boyd's illustration of ›multifunctional adaptations‹ by the examples of human hands (131), bird wings (cf. note 14), and »an elephant's trunk, which evolved to sniff, dislodge, grasp, pull, deliver, push, twist, caress, trumpet, siphon, and squirt« (81). This is evolutionary theory for preschool, if you will pardon my saying so. Sniffing, grasping, etc., are not adaptive »functions« but different *uses* of the trunk, which as a whole is not »an adaptation« itself. Instead, the elephant needs a vast range of specialized mechanisms (»adaptations«) to *show* such many different uses in the first place: an entire olfactory system in its perceptual apparatus, a sophisticated muscular system at the end of the trunk, as well as psychic mechanisms that tell it when and how to caress and

retrospectively specified, and often microscopic *change of structure* (e.g., the reacquisition of retinal cones in diurnal cenozoic mammals, the opposable thumb in monkeys, or the enlargement of the menisci with erect movement). Although Boyd, with reference to George Williams (35f.) and Nikolaas Tinbergen (41), seems to deploy this strictly analytical concept of adaptation, in actual fact he departs significantly from it. The concept he actually employs is a made-up notion of »adaptation«, idiosyncratically extended to include multifunctionality.[18] In a word, Boyd's terminology is sloppy, and ultimately inconsistent. This stands in stark contrast to the claim for logical rigor with which he means to ›refute‹ Pinker.

These deficiencies in Boyd's evolutionary-theoretical framework go hand in hand with another problem: the abstract category of ›art‹. I enjoyed reading Boyd's introduction, in which he zeros in on what he means by »art« by comparing it with various protoforms in the animal kingdom. Although he does not take the pain to summarize them for his readers, it becomes quite clear that his *criteria*[19] for labeling specific behaviors »art« are playful engagement, an endeavor for skillful design[20], an implicit directedness to others as audience, and a basic representational dimension. This seems to me an excitingly good, ethological definition of art![21] And although this is not perfectly displayed in the arrangement of the body of his book, his analysis can be understood as recounting the history of the emergence of that four-dimensional thing called art. This is another way of saying that I find parts of his reconstruction fairly convincing if I take them as an explanation of how we have come to have such a cultural (!) concept of art[22] and why we find the ›thing‹ it refers to in quite similar forms even across cultures[23]. But still I would say that even this intuitive and universally applicable concept is an abstraction from many different things (even within one culture), and thus is not a good starting point for an adaptationist analysis. Boyd rejects the position that »art is not a meaningful category« or not »a coherent class« rather laconically, saying that, »while art is indeed a fuzzy category, so is much else that matters in life, like love, which there is also reason to think has a biological origin, mechanism, and function« (69f.). Well – no. According to Helen Fisher, ›love‹ involves (at least) three different mechanisms which emerged as solu-

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when and in what tone to trumpet. And even then we have not yet got down completely to the level of minuscule changes in structure that marks the optimal analytical unit and allows for the correlation with a specific selection pressure (»function«). To put it another way: We might observe primates to have a mechanism that inclines them to pick their nose in a certain kind of situations. To frequently free the respiratory tract from obstructions, but only when there is nothing more important to do, might well be adaptively functional. But this is not to say that ›the primate hand – a highly multifunctional design – evolved to pick one's nose, among others‹.

[18] Just a glimpse at how this works: Boyd introduces George Williams as the person »who clarified *the modern concept of biological adaptation*« (my emphasis) and who »sees it as a powerful but strict and demanding notion, not to be used without warrant« (35f.). Alright! On the next page, when Boyd teaches his readers that »[t]he function need not be a single one« – »as biologists say, ›one ancestral, many derived functions‹« (37) –, this quotation is followed by a footnote indicating an essay by the literary scholar Paul Hernadi and an article on the particular subject of mammalian play from *The Quarterly Review of Biology*. A suitable reference in the usual authorities, like Williams or Tinbergen, apparently was not at hand. In the latter of the two cited articles, the »one ancestral, many derived functions« conception is, in turn, quoted from another article on animal play by another biologist, whose suggestions are much of the kind depicted in note 17. So, that's the end of »as biologists say«. Nevertheless, when coming to the proper object of his study, Boyd insouciantly rephrases his definition as follows: »An evolutionary *adaptation*, recall, is a feature of body, mind, or behavior that [...] shows evidence of good *design* for a specific *function* or functions that will ultimately make a difference to the species' survival and reproductive success« (80, emphasis in the original). In the note we find: »G. Williams 1966.« No page number. As for the careful reader, who might be interested in whether the oddly interpolated »or functions« is Boyd's or Williams' idea, well, he may go and read »G. Williams 1966« (or have a look at my quotations in note 16).

[19] Cf. his assumption (without listing) of »features common to all forms of art« (69).

[20] Cf. also 81.

[21] But, alas, when Boyd wants to »define« art, he simply puts forward his aetiological derivation of art as »cognitive play with patterns« (15), which covers only one, or two at best, of the criteria implied in his introduction.

[22] Cf. Boyd's own remark on the »key question: how did things begin to be considered as art?« (73)

[23] Cf. 70.

tions to distinct adaptive problems.[24] The many different cultural concepts of love observed in history are thus due to the fact that these mechanisms combine differently, and congregate with other mechanisms, in each period, milieu, and individual. Of course all these different combinations are also quite similar, if seen from another angle, simply because they share a certain set of biological substrates.

All this is not just a quibble about words. Boyd's reckless inconsistencies and idiosyncratic coinages have a bearing on the argumentative detail of his study. When he says, for example, that one of art's functions is social attunement, he can perhaps make it seem plausible that »in the time-based arts of human music and dance, we synchronize feeling and movement, learn how to coordinate in time and tone, and draw comfort and strength from our physical and emotional attunement« (105f.). His subsequent remarks on »visual art« serving »as an omnipresent reinforcement of shared norms« and on »pretend play and fiction« enabling us »to try out the position of others« (106), however, seem to be present merely as a matter of duty in order to assure us that this function really applies to all forms of art, even though the function itself in fact finally exceeds any literal meaning of attunement. Why not say, for example, that our *sense of rhythm* probably evolved as a means of *social coordination*? This would be a hypothesis concise enough to be tested further. And of course many arts *make use* of our sense of rhythm, but this is not to say that ›art‹ was selected as a means of social coordination (or ›attunement‹). – Another example: Boyd's preoccupation with the arts makes him occasionally overstate their significance in early human history, arguing, for instance, that they serve as »incentives for social exchange«, »long-distance trade«, and »discovery, in materials, processes, products« (123). I might have a rather boring notion of »weaving and pottery« (ibid.), for example, but I wonder if the immediate practical need to protect the body or to hold liquids is not an incomparably stronger ›incentive‹ than any admittedly existent playful engagement with materials and forms. Yet as art »foster[s] our inclination to think about possible worlds« and »builds our confidence [...] in shaping our own destinies« (124), it is not simply ›art‹ – in any strict (aetiological[25], or four-dimensional behavioral) sense – that he talks of here but, much more generally, »imagination« (ibid.), »creative habits of mind« (123), constructiveness, and so on. To be sure, art, imagination, creativity, constructiveness all have something to do with one another and moving around such abstract concepts like cards on the table is an old routine in the humanities. But Boyd, of course, purports to be making a stronger, more precise and theoretically grounded claim than this.

Another reason why it is often difficult to extract a clear line of argument from Boyd's text is that he completely avoids comparing his own suggestions with already existing accounts. He indeed cites a vast range of biological, psychological, and anthropological literature, but he remains surprisingly silent with regard to studies from his own discipline taking an evolutionary approach as well as studies coming from the human sciences which are specifically concerned with literary phenomena. Since the definition of ›art as cognitive play with patterns‹ is so important to his book, it is quite odd not to compare his considerations with those of Tooby and Cosmides as developed in their seminal essay »Does Beauty Build Adapted Minds«.[26] He might have learned there (along with some other things) that play also is probably not ›an ad-

[24] Helen Fisher, Lust, Attraction, Attachment. Biology and Evolution of the Three Primary Emotion Systems for Mating, Reproduction, and Parenting, *Journal of Sex Education and Therapy* 25 (2000), 96-104.
[25] Cf. note 21.
[26] He cites them by mentioning a side-aspect of their essay (49/422, note 21) and by using a handy phrase about the anomaly of fiction (129/433, note 2), but not a single time in his chapter on cognitive play! Maybe he thinks he has already finished with their considerations since he rejected their essay in his contribution to *The Literary Animal*. For a critique of his criticism see Katja Mellmann, Evolutionary Psychology as a Heuristic in Literary Studies, in: Simon J. James/Nicholas Saul (eds.), *The Evolution of Literature. Legacies of Darwin in European Cultures*, Amsterdam (forthcoming), note 65.

aptation‹ but rather an statistical effect of many particular »developmental adaptations« or »aesthetics«. And with all his emphasis on art's significance for arousing and shaping attention, one might have wanted to know a little more about what his theory has in common with Ellen Dissanayake's concept of ›making special‹ and also the points at which he differs from her, or perhaps amends her propositions.[27] Similarly, his thoughts about the social functions of storytelling show important points of contact with hypotheses developed in Williams Flesch's *Comeuppance*, but Boyd only refers to him once rather snidely (63/424, note 41) and does not even try a productive comparison between his own and Flesch's suggestions, or a critical discussion of the latter. H. Porter Abbott's reconstruction of »the prehistory of narrative consciousness«[28] is either unknown or not worth mentioning to Boyd. And Michelle Scalise Sugiyama, who for a decade now has been examining tens of thousands of pages of ethnographic literature to test her hypothesis of narrative being originally a means to store and extract adaptive information, is cited in a way (176/440, note 47) that shows total disregard for her overarching project. Thus, in respect to scholarly exchange Boyd's book remains an annoyingly monolithic statement.

Narrative, however, brings me to the more felicitous chapters in Boyd's book. His sketch of the many cognitive capabilities involved in understanding and representing events – from the animate/inanimate distinction across human ›theory of mind‹,[29] memory, and mental simulation, to mimesis and diegesis – has a lot in common with previous accounts in the field of ›cognitive poetics‹ (in a broad sense) which draw on a similar corpus of research from developmental psychology, the cognitive sciences, neurology, and primatology. Yet Boyd's very detailed sketch not only once again supports those ideas by coming to largely the same conclusions, but he also further substantiates the postulated algorithms from an evolutionary standpoint. Here, his evolutionary-ethological perspective proves particularly useful and enlightening. And it keeps him save from the pitfall – so common in many similar accounts – of overemphasizing an individual component (like ›empathy‹, ›imitation‹, or ›neural mirroring‹) as the all-explaining key issue. Also in his reflections on how the strategic exchange of social information relates to competitive and cooperative contexts (160-174), Boyd makes original statements and refinements.

In view of the eloquence with which Boyd describes the many spontaneous behavioral inclinations we reveal as story tellers and listeners (165-173), I am surprised that he does not contemplate an innately biased adaptation ›storytelling/narrative exchange of social information‹ (the adaptive value of which he would seem to have established quite convincingly) but instead prefers to grant ›fiction‹ (186-208) the status of the next big adaptation.[30] The problem is, however, that it remains completely unclear what exactly he understands by »narration«,

[27] There are several references to Dissanayake in his notes but no explicit discussion of her theory of art.

[28] H. Porter Abbott, The Evolutionary Origins of the Storied Mind. Modeling the Prehistory of Narrative Consciousness and Its Discontents, *Narrative* 8 (2000), 247-256.

[29] I wondered why Boyd places so much emphasis on the fact that a theory of mind (ToM) including represented beliefs is uniquely human (143, 145, 148). There is some (albeit not undisputed) evidence that other primates too may pass false-belief tests, at least in more domain-specific (foremost competitive) settings, and are capable of deception (which Boyd treats as an equal test case, 147). Moreover, other animals simply have not yet been investigated in that regard. The difference between humans' and other animals' ToM, albeit vast, might not be as clearly categorical as Boyd suggests. But I want to add that it is of no relevance for Boyd's argument whether the uniqueness of human ToM begins with the representation of beliefs itself or rather with its sophistication through language (cf. 149).

[30] He says the »advantages of [our capability to represent events] are so apparent« that its explanation (unlike that of fiction) poses »no untoward biological challenge« (188). Again, what kind of evolutionary theory is at work in this formulation?

»story/storytelling«, »pretense«, and »fiction«,[31] and which functions and design precursors he assigns to which of them. If I may just make a guess about the core assumption in this large tangle of issues, I would say that Boyd sees the reliably developing capacity for pretend play in children – helping them to »explore [...] the possible around the real« (186) – as a clue[32] about a special cognitive design (labeled »fiction«) the effects of which are not already covered by the capacity for narration (or any other cognitive capacities one might think of). The pertinent functions can be readily identified, since play generally helps develop our neural circuits and stories of any kind (the Bible, Aesop's animal fables, *Robinson Crusoe*) make us better humans by training our social cognition.

Boyd has no problem with the fact that most of his ›functions‹ do not specifically depend on fiction but could also be linked to non-fictional storytelling, or even to art and play in general (hence the vast amount of redundant information in this chapter). The only function that, in a way, is specifically related to fiction is the ›enhancement of our creativity‹ (197), which finally leads us back into the realm of imagination, creativity, and constructiveness. So what about hypothetical reasoning, here/there or once/now distinctions, conditional if/then epistemologies, probability, provisional validity, mythology, history, utopia, should/would reasoning, and so on?[33] My point is that the extended capability in humans »to think in sustained ways beyond the here and now« (198) has already been noted numerous times, under the names of ›offline‹ thinking, ›decoupling‹, or ›metarepresentation‹, to name just a few; but that one has to be a literary scholar, obviously, to see causal and hypothetical reasoning (cf. 198), for instance, insistently as derivations of ›fiction‹ (whatever this is supposed to mean then) rather than related phenomena, or even its enablers.

The Chauvet cave paintings might not have been »the casual doodles of idle afternoons«, but Boyd's reflections on religion as »invented stories that people take as true« (199), science as »fictions of a kind« (202), and various sorts of subversive fiction (207) surely are. And so is the second half of his book. The *Odyssey* lends itself as evidence that the characteristics Boyd describes have *always been* there in human storytelling, and Dr. Seuss is evidence that they are *still* there. Nobody will be surprised. (Naturally, the analysis of two literary examples is also meant to provide a model for evolutionary criticism. Also, it includes a couple of further conceptions, like that of David Bordwell's problem-solving theory of narration, which he had not already introduced in the preceding chapters. But I will stop here; other reviewers have already commented on those parts and I think I have made my point.)

To resume, Boyd's book presents a substandard kind of evolutionary theory on several counts and for the most part lacks a finalized – or at least reconstructable – argumentative architecture. As a result, none of his adaptationist major assumptions prove convincing. But, with the necessary amendments made by the reader, Boyd's study contains a richly faceted picture of art's earliest history. Furthermore, his chapters on the cognitive prerequisites and social func-

[31] »Narration« as ›representation‹; »story/storytelling« once in a while as ›narrative form/narration‹, once in a while as ›invented events/fiction‹; »pretense« as ›as-if mode‹ and, as he stresses, categorically ›different from representation‹ (181) or, in other places, as ›a mixture of direction, narration, and enactment‹ (177) (and thus also ›representation‹?); cf. also 15, 382.

[32] Boyd generally fails to explain why and how ontogenetic development can tell us anything about innate mechanisms. I am sure it can; but Boyd's saying that, »since our protracted childhood makes human life-history unique, it is appropriate that childhood offers our clearest window [...] on the origins of our interest in story« (179) indeed offers nothing that would substantiate such a claim.

[33] Cf. the postulation of a manifold cognitive ›scope syntax‹ by Tooby/Cosmides 2001, 19-22; Leda Cosmides/John Tooby, Consider the Source. The Evolution of Adaptations for Decoupling and Metarepresentation, in: Dan Sperber (ed.), *Metarepresentations. A Multidisciplinary Perspective*, Oxford 2000, 53-115.

tions of storytelling are worthwhile reading for every narratologist interested in the biological dimensions of his/her object of study.

As everybody knows, family conflicts can escalate all too quickly. I would not be criticizing Boyd's argument this way were I not terribly interested in his propositions. Boyd's book is contributing to a field which I am working in myself and which is still in an immature state of methodology and theory. Alas, after reading Boyd's monumental volume, I think it rather disserves than serves the necessary refinement of evolutionary literary theory and criticism. Not only does Boyd several times misinform his readers about central issues of evolutionary thinking, he also conveys a message of: Don't worry, we don't have to give up on our dearly held speculations on the ›uniquely human‹, the essence of ›art‹, ›creativity‹, ›sense of possibility‹, and so on. Boyd's book is at some points an unpleasant example of how the humanities often deal with the sciences: grab some key notions, and then use them as best suits your purpose. I conclude with Williams:

> In many published discussions it is not at all clear whether an author regards a particular effect as the specific function of the causal mechanism or merely as an incidental consequence. In some cases it would appear that he has not appreciated the importance of the distinction.[34]

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[34] Williams 1966, 8 f.