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# On the Origin of Adaptations: Rethinking Fidelity Discourse and “Success”—Biologically\*

Gary R. Bortolotti and Linda Hutcheon

Adaptation is a profound process, which means you try and figure out how to thrive in the world.

—The “Orchid Thief” in Spike Jonze’s film *Adaptation*

## I. The Need for New Models

CONTRARY TO THE NEGATIVE OPINION of both current academic and journalistic discourse on the topic of narrative adaptation, the “orchid thief” in Spike Jonze’s film would like us to believe that adaptation is, in fact, a “profound process.” In the immediate context, he means biological adaptation, of course, but in a metacinematic film about the process of adapting a book to the screen, the cultural implications of his positive remark should not be dismissed, despite its evident irony.<sup>1</sup> The manifest ubiquity of narrative adaptations in contemporary culture notwithstanding, the critical tendency has been to denigrate them as secondary and derivative in relation to what is usually (and tellingly) referred to as the “original.” Adaptation theory has rarely challenged this dismissive evaluation. Despite the theoretical sophistication of recent literary critical discourse, adaptation studies have remained stubbornly rooted in often unexamined values and practices. Although it seems self-evident that the insights of such theories as Bakhtinian dialogism, intertextuality, deconstruction, reception theory, cultural studies, narratology, or performance theory might have relevance to adaptation studies, these connections have only begun to be made.<sup>2</sup> In a way, therefore,

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cultural adaptation studies today find themselves in the same quandary as early evolutionary biology, as it was trying to comprehend descent with modification before the mechanism of inheritance was discovered by Mendel, or trying to understand variation among organisms before Darwin.<sup>3</sup> Like that early evolutionary theory (though unlike Darwin himself), much work in adaptation today thinks only in terms of higher and lower forms. In biology, it was only when this sort of evaluative discourse was discarded that new questions could be asked and therefore new answers offered.<sup>4</sup>

As a biologist and a literary theorist, we decided to look to the possibility of new questions—and answers—for narrative adaptation theory by investigating the relevance to cultural adaptation of the insights about adaptation in post-Darwinian biology. Therefore, we would like to propose for the sake of argument and the purposes of debate a homology—not an analogy, not a metaphoric association—but a homology between biological and cultural adaptation.<sup>5</sup> By homology, we mean a similarity in structure that is indicative of a common origin: that is, both kinds of adaptation are understandable as processes of replication. Stories, in a manner parallel to genes, replicate; the adaptations of both evolve with changing environments. Our hope is that biological thinking may help move us beyond the theoretical impasse in narrative adaptation studies represented by the continuing dominance of what is usually referred to as “fidelity discourse.” This common determination to judge an adaptation’s “success” only in relation to its faithfulness or closeness to the “original” or “source” text threatens to reinforce the current low estimation (in terms of cultural capital) of what is, in fact, a common and persistent way humans have always told and retold stories.<sup>6</sup> Shakespeare transferred his culture’s narratives from page to stage and made them available to a whole new audience; we did not begrudge him his creative borrowing. Baz Luhrmann transferred one of these, *Romeo and Juliet*, from page to screen, updating it in the process and arguably making it available to a whole new teen audience; the critics excoriated him for his irreverence and nerve. His film, *Shakespeare’s Romeo & Juliet*, was deemed unfaithful to its source, despite using most of the text and action. Our starting point, therefore, is the question: how useful is this kind of reductive judgmental discourse in determining either the artistic significance of a work or its cultural impact or even its vitality?

While we acknowledge that part of the manifest pleasure (and risk) of adaptations lies in their relation of proximity to (or distance from) their adapted texts, in order to provoke discussion we want to take a strong stand here and suggest that fidelity to the “original” could, in fact, be seen as irrelevant to the actual evaluation of the “success” of an adaptation for two very different reasons. On the one hand, an adaptation stands

on its own as an independent work, separate from the “source,” and can be judged accordingly; this would be true no matter what the critical perspective of the assessor might be—feminist, Marxist, postcolonial, and so on—and whether context (as opposed to source) were deemed relevant or not.<sup>7</sup> In this instance, then, fidelity becomes a less than useful evaluative aesthetic criterion. On the other hand, the impact of an adaptation can far exceed anything measurable only by its degree of proximity to the adapted work. The story it retells is clearly significant, but not in this sense. We will argue that, in relation to the adapted story, what we might consider the “success” of an adaptation can be thought of in very different ways. It is obviously important to the understanding of an adaptation *as* an adaptation that we investigate where it has come from (in other words, what biologists would call its phylogeny or evolutionary history). When we shift from “fidelity” concerns to undertaking this related but different kind of study, new analytic opportunities present themselves. By revealing lineages of descent, not similarities of form alone, we can understand how a specific narrative changes over time. If we take this history into consideration, suddenly it is the success of the narrative itself, as well as that of its adaptations, that can be considered in a new light. Thinking in terms of this biological homology therefore offers another—in this case, we hope, productive or at least less reductive—way to think about what constitutes an adaptation’s success than does the misleadingly evaluative discourse of fidelity. But it also gives us a way to think anew about the broader questions of *why* and *how* certain stories are told and retold in our culture. (We should also add that, to avoid confusion between adaptation as a narrative *product* and the *process* of adaptation in biology or culture, from here on we will signal the former, the product, in bold as an **adaptation**.)

As the language of “original” and “source” so treasured by fidelity discourse suggests, the (post-)Romantic (and capitalist) valuing of the originating creative artist-genius explains in part the denigration of **adaptations**: specifically, the relegation of the adapter to journeyman status in Hollywood (and elsewhere) and of the adaptation itself to the trash heap of the secondary and imitative in critical evaluative discourse. The results of this denigration can be seen in the defensive tone of **adaptation** criticism, but even more seriously, in its limitation to the close reading of specific **adaptations**—most often of novel to film.<sup>8</sup> This is a critical practice that implicitly or explicitly gives cultural and aesthetic precedence to the “source” to which the **adaptation** is then judged either faithful or unfaithful—that is, good or bad. In contrast, biology does not judge adaptations in terms of fidelity to the “original”; indeed, that is not the point at all. Biology can celebrate the diversity of life forms, yet at the same time recognize that they come from a common origin. No one

would argue that humans are not unique or special, even though they share 98 percent of their DNA with the chimpanzee—proof that both are, in a sense, adaptations of an ape ancestor. The kind of descriptive rather than evaluative thinking that biology potentially provides in this instance suggests new ways of thinking about cultural **adaptation** theory and, beyond that, about the reason for the continuing importance of certain narratives in a given culture.

The basic question to be answered in biology has been: why does life exist in such a dazzling array of forms? This is, in fact, what prompted Darwin's investigation into the "origin of species." The cultural equivalent might be: why do the same stories exist in such a startling array of forms?<sup>9</sup> Just as the discovery of genetics allowed for the quantification of evolutionary change in biology, so perhaps can a more descriptive approach to the elements of cultural adaptation allow us a different way of thinking about why we choose to retell stories and how those retellings function within a culture.<sup>10</sup> Biologists do not evaluate the merit of organisms relative to their ancestors; all have equal biological validity. So too, we will argue, do cultural **adaptations** have equal cultural validity, and not only those by Shakespeare. We are not saying that cultural adaptation is biological; our claim is more modest. It is simply that both organisms and stories "evolve"—that is, replicate and change.<sup>11</sup>

We are aware of the ideological/epistemological/methodological critiques of science in general and biology in particular; nevertheless we see significant benefits to using this homology heuristically to open up the discourse of adaptation studies to new perspectives. Like literary theory, evolutionary theory is not a natural "given," but as human constructions, perhaps together they can help us make sense of a shared interest in repetition and change. What biologists call "systematists" study the patterns of variation with regard to the geography and environment that a "species" occupies and, beyond that, investigate the evolutionary processes that cause the variation; it is in this spirit that we seek to study narrative variation.<sup>12</sup> What the recognition of the homology between cultural and biological evolution can provide is an alternative means of deciding what we could consider the success of an **adaptation**—that is, not as simply faithful or unfaithful (aka good or bad) in relation to a "source."<sup>13</sup> Instead, the "source" could perhaps be more productively viewed as the "ancestor" from which **adaptations** derive directly by descent. As in biological evolution, descent with modification is essential.

## II. Replication and Adaptation

In his 1976 study *The Selfish Gene*, biologist Richard Dawkins bravely (and some say, foolishly) introduced the concept of "meme" as the cul-

tural equivalent of the biological gene and launched a much-debated new discipline called memetics.<sup>14</sup> The *Oxford English Dictionary* now contains a definition of *meme* (as “a self-replicating element of culture, passed on by imitation”). For Dawkins, cultural transmission, like genetic transmission, is “basically conservative” but “can give rise to a form of evolution.” Language, fashions, technology, and the arts, he argues, “all evolve in historical time in a way that looks like highly speeded up genetic evolution, but has really nothing to do with genetic evolution.”<sup>15</sup> We would like to adapt, rather than adopt, Dawkins’s meme concept, in part because of the many trenchant critiques of it from a biological as well as cultural standpoint.<sup>16</sup> Instead of Dawkins’s general concept of memes as ideas, we want to substitute narratives, because of the ubiquity and persistence of their **adaptations**. Like the idea of the meme, a story too can be thought of as a fundamental unit of cultural transmission: “a basic unit of inheritance allowing the accumulations of adaptations.”<sup>17</sup> As our culture has added new media and new means of mass diffusion to our communications repertoire, we have needed (or desired) more stories. What we have in fact often done, however, is to retell the same stories, over and over again—on film and television, in videogames and theme parks.<sup>18</sup>

Like genes, narratives are “replicators,” defined by Dawkins as “anything in the universe of which copies are made.”<sup>19</sup> Replication is about survival over time. High survival, argues Dawkins, depends on obvious things like longevity and fecundity, but also on what he calls “copying-fidelity.”<sup>20</sup> However, contrary to the fidelity discourse of adaptation theory, in a cultural context, copying actually means *changing* with each replication—most often, changing medium. Nevertheless, it is obviously also the case that for an **adaptation** to be experienced *as an adaptation*, recognition of the narrative has to be possible: some copying-fidelity is needed, precisely because of the changes across media and contexts. There is a popular misconception in the lay understanding of biology today (and, in fact, this is what plagued early evolutionary biology) of *whose* survival adaptations are for. They are to ensure *not* the survival of the group or the individual organisms, but instead the “relevant replicators themselves.”<sup>21</sup> This is why it is important to define the replicator as a distinct and discrete entity, for this is the unit of selection by which we can understand change over time. For our purposes in discussing the process of cultural adaptation, then, Dawkins’s replicator would be a core narrative idea (or in short, a narrative).<sup>22</sup>

However, a replicator requires a vehicle, that is, an “integrated and coherent ‘instrument of replicator preservation.’”<sup>23</sup> Organisms act as vehicles for genes; the literary texts or the stage performances we call **adaptations** are the vehicles of narrative ideas—that is, their physical embodiment in some medium.<sup>24</sup> From the point of view of the replica-

tor (narrative), when a vehicle is no longer adequate (because, as in biology, vehicles have varying lifespans or the environment has changed sufficiently), a new vehicle is necessary to propagate the story. In refashioning Shakespeare's play, *The Taming of the Shrew*, for the screen in 1967, Franco Zeffirelli cast two of the hottest actors of the day—Elizabeth Taylor and Richard Burton—to displace the earlier film version, dethroning its stars, Mary Pickford and Douglas Fairbanks. The narrative could be said to have undergone an appropriate transformation to the change in environment, that is, an **adaptation**.

### III. Mutation and Selection

As we have seen, replication is not repetition without change, and this is a crucial point in both biology and culture. At what level does change occur, however? A distinction is needed here: in classical biology, phenotypes are distinguished from genotypes. The latter are the underlying blueprints, if you like; the former are what we actually see in the context that produces them. Another way to think of this is: genotype + environment = the phenotype we see and experience. So the parallel structure for a narrative phenotype would be: narrative idea + cultural environment = **adaptation**. Or, to translate: "love-death" plot + western-European culture = *Romeo and Juliet*, eventually: Shakespeare adapted Arthur Brooke's versification of Matteo Bandello's adaptation of Luigi da Porto's version of Masuccio Salernitano's story of two very young, star-crossed Italian lovers—who changed names and places of birth along the way. *Romeo and Juliet* in its turn became an independent narrative with its own **adaptations**. In both biological and cultural terms, then, what exists today is the result of successful replication.

Changes in the environment often bring about changes in the phenotype, whether that environment be biological or cultural. Is it surprising that Otomar Krejca in Prague (1963) or Tamás Major in Hungary (1971) used their particular national politics to frame their versions of the feuding opposition to the love of Romeo and Juliet? Or that the Québécois Robert Lepage set his **adaptation** in bilingually conflicted Canada, with francophone Capulets and anglophone Montagues? In the opinion of the play's recent editor, Jill Levenson: "Versions of the Romeo and Juliet narrative continue to proliferate, and there is no reason to expect a slackening of momentum any time soon. From Brazilian chapbook to Bosnian documentary, from comic strip to soft-pornographic video, the story dramatized by Shakespeare is reshaped to fit the preoccupations and tastes of modern cultures."<sup>25</sup> Or in Dawkins's terms, "some memes are more successful in the meme-pool than others";<sup>26</sup> success is the product of the process of selection.

Cultural selection, like natural selection, involves differential survival through a process of replicating into future generations. We would posit that, like its biological homologue, cultural selection is therefore both conservative and dynamic. As in biology, there can be directional or stabilizing selection. When an environment changes in one particular identifiable direction, then we expect the former, as **adaptations** move toward a new cultural norm: for example, what was a minor terrorist subplot might shift to center stage after 9/11. But when an environment is stable we can predict that **adaptations** will differ little from the previous generation. The latter evidently was the case when director Christopher Columbus adapted the first Harry Potter novel to the screen.<sup>27</sup> Because the film came out soon after the immensely popular book, the fan culture was arguably not expecting or desiring a reinterpretation of the story, but simply a retelling of it in a new medium.

Mutation is the raw material of evolution. Despite some of its nonscientific connotations, mutation is not a negative term in biology where it is judged as beneficial, neutral, or deleterious in the context of its environment. In cultural terms, we could think of mutation, that is, any change in a narrative, in exactly these terms: if a musical theater **adaptation** of a film were to change the protagonist's nationality from Italian to French, the change might be viewed as beneficial in one culture (perhaps, French) but deleterious in another (Italian); yet it might not matter at all in yet another (Chinese). Not all mutations or changes over time are adaptive, because not all are meaningful with respect to allowing a better fit to an environment. For instance, the musical might also change the color of the protagonist's shoes. When that color is without symbolic or narrative value, the change is *not* adaptive; in biological terminology, it is neutral with respect to selection. But if we are adapting the movie called *The Red Shoes*, any such change is significant in that it has the potential to be selected *for* or *against*. What we then end up with is the product of cultural selection; what have survived are mutations that allow the story to better fit (adapt to) its culture or environment. A potential problem in the study of adaptation (and **adaptations**) is not realizing that what we end up seeing are the survivors. Failed attempts are eliminated in both biology and culture.<sup>28</sup>

There are still other ways in which things can mutate over time but not be **adaptations**—in biology as in culture. For example, in biology, what is called mutation pressure as an evolutionary force is the accumulation of errors in DNA replication over time. The equivalent for a narrative would be translating or editing errors or loss of details through copying. Another nonadaptive explanation for changes over time is what biologists call random (or genetic) drift.<sup>29</sup> It, too, has its cultural homologue, for random events are sometimes the only explanations for narrative changes. For example, when a four-volume novel is damaged



in a fire so that today we have only one volume, that truncated version of the narrative is not an **adaptation**. However, if those lost volumes were deliberately suppressed, then we might well consider it an **adaptation** in the sense that there would have been a deliberate political intent to alter the narrative. Understanding these distinctions helps us address the issue of what is, and what is *not*, an **adaptation** per se in cultural terms as well as biological.

#### IV. Redefining “Success”

In the study of adaptation in both biology and culture, a significant concern is the identifying of attributes that are essential to the propagation of the replicator. Replicators compete for limited space, time, and attention in a culture.<sup>30</sup> “Success” in this context means “thriving.”<sup>31</sup> The second part of the epigraph from the film *Adaptation* makes this clear: “Adaptation is a profound process, which means you try and figure out how to thrive in the world.” The concept of “survival of the fittest” was a problem for Darwinism because of the obvious tautology it implied.<sup>32</sup> The idea of “thriving” is closer to what Darwin meant, however. In cultural terms the kinds of new questions this redefinition of success as thriving permits us to ask would include: What has made a narrative successful—that is, what has made it thrive in occupying a particular cultural space? What roles have **adaptations** played in this propagation? In other words, what makes an **adaptation** successful? Are there quantitative ways to determine success defined in this way?

In trying to answer the latter question, work in memetics has focused on numbers of copies: in a parallel with population size in animals, we could look, for example, at how many people are aware of a narrative. But there are at least two other important dimensions to consider when determining a narrative’s success. The first is persistence and involves evaluation over the long term. In biology, for instance, it remains to be seen if humans are successful relative to dinosaurs. Our meager 6-million-year existence does not yet compare well to their 150-million-year reign. In culture, as Dawkins put it, the time is “highly speeded up,” compared to this, but stories can stick around for a long time and still be current; so we could say that the Romeo and Juliet narrative is successful in these terms. Of course not all stories have such temporal stamina, and in fact may go extinct; like museums with fossil collections, libraries contain books with stories in them that are never read, much less adapted.

The second consideration in determining success, besides persistence, is diversity. If a narrative is adapted into many different media, we might use this proliferation of forms as a measure of success. These new ver-

sions would in turn allow other opportunities for future **adaptations** and thus insure longevity because of the medium change: people in a culture may stop attending musicals, but they may still watch television. Another way to think about diversity is in terms of the range of environments exploited. Even if all the other measures of success are equal, the one that flourishes in a wider range of cultural contexts could be considered more successful than the one that exists in only a few. If for no other reason, diversity equates with success because it reduces the probability of chance or other events causing the demise of the narrative. So transculturation or cross-cultural indigenization would be a sign of the success of a narrative. Some stories do indeed migrate across cultures as well as media.<sup>33</sup> A good example is the narrative of the stereotypical femme fatale, the woman who is both alluring and terrifying to men. There are many versions of her story,<sup>34</sup> but let us take just one of them as a brief example: that of a Spanish gypsy called Carmen.

In 1845, the French writer Prosper Mérimée published a travel tale that retold a story of Carmen's life, loves, and death that had been recounted to him by a friend. Within a few years Marius Petipa had choreographed a ballet about her. But her cultural replication was insured with the next major **adaptation** undertaken by Henri Meilhac and Ludovic Halévy for Georges Bizet's opera (1875). From here Carmen's story migrated across media (to film, more ballets, hip-hop musicals, even figure skating shows) and, even more interestingly perhaps, across national boundaries. Otto Preminger's 1954 Americanization, called *Carmen Jones*, translated the operatic narrative into a popular stage (and then film) musical, set in the Second World War and with an all-black cast. Spanish director Carlos Saura could be said to have "re-hispanized" and even "re-gypsified" Carmen in a flamenco idiom and in a postmodern, self-reflexive manner in his 1983 film **adaptation** of both the Mérimée text and the Bizet opera. *Karmen Gei* (2001), by African film director Joseph Gai Ramaka, was set to indigenous Senegalese music and choreography, but the story of the dangerous but alluring woman remained legible, despite the cultural transposition. Carmen's narrative has indeed adapted successfully to new and different cultural environments.<sup>35</sup>

Emerging technologies, of course, have always allowed for new possible **adaptations** of narratives. The biological concept of adaptive radiation has a cultural homologue in this context. When species find themselves in a novel environment—and if it is one where there are few competitors and many opportunities—they may further diversify and adapt to novel ecological roles. For example, the many species of Darwin's finches on the Galapagos proliferated from a single, ancestral species that colonized the islands and evolved new lifestyles.<sup>36</sup> In a like manner a narrative can proliferate when it finds novel opportunities in

new media.<sup>37</sup> This can lead to a diversifying of the narrative unit into different narratives eventually. We need only think of the many versions of the familiar story of the journey of the hero, changing and modifying to fit different environments. These range from the classical epic narratives of Aeneas and Odysseus to the operatic ones of Wagner's Siegfried to those of the *Lord of the Rings* in the form of books, movies and, most recently, musical theater. One might argue that the cinematic version of Tolkein's stories was waiting for particular technologies in order to adapt the books' fantasy world to the screen.

As this discussion implies, in both biology and culture, the success of the replicator is not the same as the success of the vehicle. The replicator's (narrative's) success is measured by its survival in the form of long-lived copies and versions of itself: that is, by its persistence, abundance, and diversity. The vehicle's (**adaptation's**) success is measured by its capacity to propagate the replicator that rides inside it, so to speak.<sup>38</sup> Therefore, in order to determine what constitutes the success of an **adaptation**, we might ask different questions than usual, such as: how many people saw the musical or played the videogame, and therefore now know the narrative? What is striking here is that the degree of fidelity to the "original" is no longer an issue. What determines an **adaptation's** success is its efficacy in propagating the narrative for which it is a vehicle.

That said, we repeat that we take it as axiomatic that **adaptations** also stand alone as independent works that cannot rely on reference to the one they adapt. But we are trying here to find new ways of talking about **adaptations as adaptations**—without using that misleadingly evaluative discourse of fidelity. The biological homology allows us to ask new and perhaps newly appropriate questions (beyond the ones about qualitative criteria with which the humanities usually concern themselves). For instance, to discover whether a videogame is successful as an **adaptation** of a movie, we might ask not about how faithful it was but instead about perhaps strange-sounding issues such as how and why the adaptation helped to propagate the core narrative idea. While, admittedly, it may be difficult to ascertain how many people "know" a story, we can use surrogate measures: if book sales go up after a television **adaptation** of a novel, that would be one way to gauge the success of the **adaptation** (and, of course, the narrative). So, too, would be the number of movie or play tickets sold—seen as a measure of attendance, rather than of financial gain. Other related and more specific questions can now be posed: what is the adaptive significance of the choice of actors, for example, or of setting the television version in a different country or time than the novel does? Or to take the case of the decision to film a movie version on location or in a studio, the on-location set may be more realistic in the context of the novel setting, but studio filming might be consider-

ably less costly. Therefore, if more money is left to spend on advertising, more people may ultimately see the film. So the studio version might well be more successful numerically in propagating the narrative and making it known to more people.

Biology offers yet another concept that is suggestive in a homologous manner for cultural adaptation: the phenotype of the replicator can exist beyond the body of the vehicle. This is known as the extended phenotype.<sup>39</sup> The impact of that phenotype on the world at large affects the survival of the replicator. For nature, think of beaver dams. They are structures external to the beavers themselves, but that have a profound impact on the subsequent success of the beavers. For stories, think of how things like CDs of soundtracks, posters, advertising, free toys distributed with meals at fast food outlets, magazine articles, and interviews with actors on television all function to help the narrative become popular—that is, to enhance the probability of the propagation of the replicator—for more people will see the film and thus know the narrative. This is one of the mechanisms of adaptation.<sup>40</sup>

## VI. The Usefulness and Limits of the Biological/Cultural Homology

The natural environment cannot induce the changes necessary for biological adaptation: mutations are random with respect to the direction of adaptation required for the environment. Some fail and some succeed. But culture, on the contrary, at least potentially, directs changes. This fact introduces a level of complexity in identifying causality that clearly has no parallel in biology: in a cultural context, adaptations influence culture and culture influences the nature of adaptations. As L. L. Cavalli-Sforza and M. W. Feldman point out, in culture, unlike biology, changes “are not truly random, but are designed to solve specific problems” and so are “purposive and intelligent.”<sup>41</sup> In other words, it is people who change stories and do so with particular intentions. Biology cannot help us here. Or perhaps we should say that biological *discourse* cannot help us here; it is the discourse of culture (as constructed in opposition to “nature”) that foregrounds intentionality rather than pure randomness.

Nevertheless, despite this significant difference, the homology we are offering here does allow a different perspective on some of the theoretical problems around adaptation, especially the issue of fidelity as the major criterion of evaluation. In moving us out of an evaluative discourse and into a descriptive one, it also permits us to ask new questions, such as: when does an **adaptation** (as *Romeo and Juliet* was, once upon a time) change enough to be considered another story? Could we turn to some

of the tools that exist to study evolutionary relationships among organisms to answer this question? For instance, what is called *cladistics* is the phylogenetic (evolutionary) analysis in biology where the use of shared derived characteristics (where two organisms are similar because they are related) allows us to map patterns of descent. The relationships are illustrated by means of evolutionary trees known as dendrograms (specifically cladograms) that offer a tracking technique that has already been applied to study the evolution of languages and the success of ideas in novels.<sup>42</sup> A phylogenetic model for thinking about the evolution of narrative might allow us to identify exactly which of many potential vehicles of the narrative is in fact the ancestral form and therefore what process (and products) eventually led to any particular **adaptation**. One could easily make a film “**adaptation**” of *Romeo and Juliet* today without ever reading the Shakespearean play. Therefore, in trying to determine why certain scenes were omitted, for instance, we would have to identify whether it was the decision of the immediate adapter or a predecessor. This, however, is only a suggestion for future work. What the biological homologue we are suggesting most obviously does is to allow us a new way to think about the success of an **adaptation** as an **adaptation**, and, beyond that, to consider the success of the adapted narrative. In our attempt to determine and understand what might constitute that success from a biological perspective, we want to repeat that what we are here calling the “success” of an **adaptation** could and should be different from its artistic evaluation (which is another way to define success, we agree). Cultural impact and aesthetic value have rarely been synonymous; the same is true for artistic merit and economic success. Our principal aim has been to use biological concepts in a heuristic manner to help free narrative **adaptation** theory from the conceptual restrictions of a misleading evaluative fidelity discourse and thus to open up a new way of thinking about the human desire to tell and retell certain stories, resetting them in wildly different times and places, and using a wide diversity of media to do so. For the half-century following the publication of the *Origin of Species*, biology was considered “the most flexible and suggestive of the sciences, its concepts were malleable, ready to plasticise under pressure and ready to fill every cranny of whatever mould had been prepared to receive them.”<sup>43</sup> Perhaps the time has come to let at least evolutionary biology be flexible (and helpful) once again. As Terry Pratchett has reminded us: “Stories, great flapping ribbons of shaped space-time, have been blowing and uncoiling around the universe since the beginning of time. And they have evolved. The weakest have died and the strongest have survived and they have grown fat on the retelling.”<sup>44</sup>

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## NOTES

- 1 We are not alone in being inspired by this self-reflexive film. See Robert Stam, "Introduction: The Theory and Practice of Adaptation," in *Literature and Film: A Guide to the Theory and Practice of Film Adaptation* (Oxford: Blackwell, 2005), 1–2. But, since he is working on film and literature alone, his interest in the movie's biological message is considerably different from our own, given his focus on the parasitic dimension of adaptation.
- 2 Robert Stam's recent work has been exemplary in this regard: see "Introduction," 8–12 especially.
- 3 Gregor Mendel effectively discovered that parents pass on their traits to offspring through genes, and Darwin proposed natural selection as a major force in evolutionary change.
- 4 Barbara Herrnstein Smith, in *Contingencies of Value: Alternative Perspectives for Critical Theory* (Cambridge, MA: Harvard Univ. Press, 1988), reminds us that "[a]ll value is radically contingent, being neither a fixed attribute, an inherent quality, or an objective property of things but, rather, an effect of multiple, continuously changing, and continuously interacting variables" (30).
- 5 In doing so, we also avoid the problems outlined by Gillian Beer in *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot, and Nineteenth-Century Fiction* (London: Routledge and Kegan Paul, 1983), 96, when she accuses Robert Young (in his essay "Darwin's Metaphor: Does Nature Select?") of taking one single metaphor in isolation.
- 6 In response to decades of adaptation criticism, witness Stam's list of negative terms used to describe adaptations: "Terms like 'infidelity,' 'betrayal,' 'deformation,' 'violation,' 'bastardization,' 'vulgarization,' and 'desecration' proliferate in adaptation discourse, each word carrying its specific charge of opprobrium. 'Infidelity' carries overtones of Victorian prudishness; 'betrayal' evokes ethical perfidy; 'bastardization' connotes illegitimacy; 'deformation' implies aesthetic disgust and monstrosity; 'violation' calls to mind sexual violence; 'vulgarization' conjures up class degradation; and 'desecration' intimates religious sacrilege and blasphemy." Stam, *Literature and Film*, 3.
- 7 This is one way of defining "success," of course, but as shall become clear, it is not our focus here.
- 8 For a broader theorization of adaptation in general, see Linda Hutcheon, *A Theory of Adaptation* (New York: Routledge, 2006) and Julie Sanders, *Adaptation and Appropriation* (New York: Routledge, 2005).
- 9 Just as Gavin asked "Why ask why?" to stimulate applied biologists to consider evolutionary questions, we believe the study of the evolution of narratives is potentially a way for everyone from film critics to marketing analysts to understand better the power and the broader function of narrative in their work. See T. A. Gavin, "Why Ask 'Why': The Importance of Evolutionary Biology in Wildlife Science," *Journal of Wildlife Management* 55 (1991): 760–66.
- 10 We are not suggesting, however, that human involvement with stories is a "cross-culturally universal, species-typical phenomenon," as do John Tooby and Leda Cosmides in "Does Beauty Build Adapted Minds? Toward an Evolutionary Theory of Aesthetics, Fiction and the Arts," *Substance* 94–95 (2001): 7.
- 11 We are therefore not arguing, as do David P. Barash and Nanelle R. Barash in *Madame Bovary's Ovaries: A Darwinian Look at Literature* (New York: Delacorte, 2005) from evolutionary psychology, that certain stories remain popular because they narrate biological imperatives: Othello's jealousy stems from male-male competition, for instance. For an amusing critique of this perspective, see Mark Lawson, "Books for the Beagle-eyed," *The Guardian*, November 11, 2005. Nor are we arguing the biological "adaptiveness of cultural transmission" as do Robert Boyd and Peter J. Richerson in *Culture and the Evolutionary Process* (Chicago: Univ. of Chicago Press, 1985), 117 or that culture is an evolutionary process in

its own right, as the “gene-culture co-evolutionists” argue (see Derek Gatherer, “Cultural Evolution: The Biological Perspective,” *Parallax* 12, no. 1 [2006]: 58). For a critique of this position, see Stephen Jay Gould, *Full House: The Spread of Excellence from Plato to Darwin* (New York: Harmony Books, 1997), 219–20.

12 We therefore are also more restricted in our focus and interest than are L. L. Cavalli-Sforza and M. W. Feldman, in *Cultural Transmission and Evolution: A Quantitative Approach* (Princeton: Princeton Univ. Press, 1981), with their very large-scale parallel between genetic transmission and cultural transmission and their mathematical modeling.

13 In our deliberate limitation, we clearly differ here in our aim and our scope from the more expansive claims of what have been called “literary Darwinists”: see the work of Joseph Carroll, especially his book *Literary Darwinism: Evolution, Human Nature, and Literature* (New York: Routledge, 2004) where he argues that literary works reflect and articulate the vital interests of humans as living organisms. This vast claim is not our concern or focus. Nor are we interested in pursuing the equally large question of the role of culture and biology in human behavior. For a summary of these latter approaches, see Boyd and Richerson, *Culture and Evolutionary Process*, 281.

14 Richard Dawkins, *The Selfish Gene* (New York: Oxford Univ. Press, 1976). For summaries and analyses of memetics, see Susan Blackmore, *The Meme Machine* (Oxford: Oxford Univ. Press, 1999); Kate Distin, *The Selfish Meme: A Critical Reassessment* (Cambridge: Cambridge Univ. Press, 2005), and Robert Aunger’s “Conclusion,” in *Darwinizing Culture: The Status of Memetics as a Science*, ed. Robert Aunger (Oxford: Oxford Univ. Press, 2001), 205–32. Memeticists have been accused of not developing any empirically grounded theories of the mechanisms responsible for cultural transmission or for the generation of new cultural variants. See Matteo Mameli, review of Distin, in *Notre Dame Philosophical Reviews*, September 16, 2005, <http://ndpr.nd.edu/review.cfm?id=4001>; Gatherer, “Cultural Evolution,” 65–66.

15 Dawkins, *The Selfish Gene*, 204.

16 For a balanced analysis of these objections, see Robert Aunger, “What’s the Matter with Memes?” in *Richard Dawkins: How a Scientist Changed the Way We Think*, ed. Alan Grafen and Mark Ridley (Oxford: Oxford Univ. Press, 2006), 176–88. Michael Ruse, in *Darwinism and its Discontents* (Cambridge: Cambridge Univ. Press, 2006) calls the meme a “loose analogy” (241) only. There are other reasons the meme concept is difficult to work with, including the infection/parasite model that memetic theorists have used, suggesting that memes are exogenous. See Paul Bouissac, “Editorial: Memes Matter,” *The Semiotic Review of Books* 5, no. 2 (1994): 1–2; and his paper to the DARPA symposium in Arlington, VA, April 4–5, 2006, entitled “To Catch a Meme: Biological and Psychological Perspectives on Memetics.”

17 Aunger, “What’s the Matter with Memes?” 176.

18 See Hutcheon, *A Theory of Adaptation*, passim. Not only stories are adapted, of course; conventions of genres, etc. can be as well, but our focus here is specifically on narrative.

19 Dawkins, *The Extended Phenotype: The Gene as the Unit of Selection* (Oxford: Freeman, 1982), 83.

20 Dawkins, *The Selfish Gene*, 209. The degree of copying-fidelity necessary for memes to be good replicators has been a matter of much debate.

21 Dawkins, *The Extended Phenotype*, 84.

22 Even in biology, it should be noted that there is a continuing debate about whether genes or organisms are the unit of selection. Not surprisingly, the discussion of what constitutes a unit of replication in culture as a whole is a matter of considerable debate in memetic circles as well (see Dawkins, *The Selfish Gene*, *The Extended Phenotype*), but in our more limited context of **adaptations**, the replicator is easier to define.

23 Dawkins, *The Extended Phenotype*, 114.

24 David Hull discusses Dawkins's idea that the human brain is the actual vehicle for memes and suggests the plausibility of computers in this role as well. Our more limited homology makes it easier to identify the parallel to biological vehicles. See David Hull and John S. Wilkins, "Replication," *The Stanford Encyclopedia of Philosophy* (Fall 2005 Edition), ed. Edward N. Zalta, <http://plato.stanford.edu/archives/fall2005/entries/replication/>. See Liane Gabora, "Ideas Are Not Replicators but Minds Are," *Biology and Philosophy* 19, no. 1 (2004): 127–43 for an argument that minds are not vehicles but replicators.

25 Jill Levenson, introduction to *Romeo and Juliet*, by William Shakespeare (Oxford: Oxford Univ. Press, 2000), 95. See also James N. Loehlin, introduction to *Romeo and Juliet*, ed. Loehlin (Cambridge: Cambridge Univ. Press, 2002), 85: "The latest appropriations of *Romeo and Juliet* are part of a long history of reinvention, whereby successive cultures have used the play to figure their own civil brawls and death-marked loves."

26 Dawkins, *The Selfish Gene*, 208.

27 Quoted in Glenn Whipp, "Director Remains Faithful to Harry," *Toronto Star*, September 21, 2002.

28 We may marvel at the mutations that produce cold-hardiness like warm fur on animals in the Arctic, but let us not forget that similar mutations presumably appeared in some unfortunates living in the tropics! As a result, at least in biology, adaptations can appear to be optimally, even exquisitely, designed when they are not. Such is the product of natural selection; nonetheless, historically, or to some extent even today, such an observation can, for some people, only be logically explained by the action of a divine power.

29 As an example of random or genetic drift, imagine that some seeds from a palm tree floating on the ocean get lucky and wash up on shore, where they establish themselves as a new population. Only a few seeds are what are called colonizers, and they contain only a small portion of the total variation in the genetic material that comprised the original population. The genetic makeup of the new population is thus a random sample of the original, and as a result the new plants may be on average taller, shorter, thicker, etc. than the parental stock by chance alone.

30 As Franco Moretti has argued about the literary canon, "very few books, occupying a very large space." Moretti, "The Slaughterhouse of Literature," *Modern Language Quarterly* 61, no. 1 (March 2000): 211.

31 Again we stress that determining the success of an adaptation as an independent work of art is different from determining its success *as an adaptation*—our concern here.

32 Darwin did not coin this term and only used it in later editions of *On the Origin of Species*.

33 For more discussion of biological and cultural "migration," see Cavalli-Sforza and Feldman, *Cultural Transmission and Evolution*, 68.

34 See Bram Dijkstra, *Idols of Perversity: Fantasies of Feminine Evil in Fin-de-Siècle Culture* (New York: Oxford Univ. Press, 1986).

35 W. B. Watt, in fact, defines biological adaptation in similar terms as the degree of suitedness between organisms and their environments. See his "Adaptation, Fitness and Evolution," in the *International Encyclopedia of Social and Behavioral Sciences*, ed. Neil J. Smelser and Paul B. Baltes (Amsterdam: Elsevier, 2004), 66–72, <http://sciencedirect.com/science/referenceworks/0080430767>.

36 These conditions are uncommon and so it is not surprising that most examples of adaptive radiation involve organisms accidentally colonizing islands with few other species.

37 For proliferation to be **adaptation**, this means new forms (book to film) not just copying formats (video to DVD).

38 Dawkins, *The Extended Phenotype*, 114.

39 See Dawkins, *The Extended Phenotype*, *passim*.



40 Mechanisms differ from functions, however, as we have seen: the function of adapting from novel to film may be to reach people who don't read novels anymore; the story must now be told in a more culturally acceptable and accessible way.

41 Cavalli-Sforza and Feldman, *Cultural Transmission and Evolution*, 66.

42 See Moretti's *Graphs, Maps, Trees: Abstract Models for a Literary History* (London: Verso, 2005), where he uses not cladograms but rather phenograms. For a critique of this model in science, see W. Ford Doolittle, "Uprooting the Tree of Life," *Scientific American* 282, no. 2 (2000): 90–95.

43 Peter Morton, *The Vital Science: Biology and the Literary Imagination* (London: Allen and Unwin, 1984), 224.

44 Terry Pratchett, *Witches Abroad* (1991; repr., New York: HarperTorch, 2002), 8.