Emotional responses to fiction: An evolutionary perspective

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1. Introduction: The paradox of fiction

Across cultures, humans create fictional worlds. Storytelling is a cross-cultural phenomenon, taking various forms, such as narrative dances that act out passages of the Rāmāyaṇa and Mahābhārata, Latin American telenovelas, recitations by West African *griots* (troubadours) accompanied by a *kora* (21-string lute), and intricate Russian novels. Narratives elicit emotions. Like with other artworks, some of these emotions are evaluative, directed at the artwork as artwork. We may find a story beautiful, intriguing, exhilarating, or merely bland, predictable, or boring. Other emotions are directed at elements within the narrative, such as empathy with its characters. Chekhov's play *Uncle Vanya* elicits empathy for Vanya and Sonya. When king Stannis Baratheon sacrificed his only daughter Shireen to ask for divine help in battle, viewers of the HBO show *Game of Thrones* watched in horror how the girl pleaded in vain to be spared.

There is an enduring discussion about the *paradox of fiction*. One version of this paradox concerns the possibility of emotions elicited by fiction. We know that Vanya and Sonya are not real persons, yet we feel empathy for them; we know that Shireen is not a real girl, yet we grieve for her. As Levinson (1990, 79) summarizes the paradox, "Since fictional characters do not exist, and we know this, it seems we cannot, despite appearances, literally have towards them bona fide emotions—ones such as pity, love, or fear—since these presuppose belief in the existence of the appropriate objects." More formally, the possibility paradox of fiction holds that there is an inconsistency between the following three statements:

Possibility Paradox

PF1 We have genuine emotional responses to fiction.

PF2 We do not believe that the characters and situations in fiction exist.

PF3 We are only genuinely moved by things we believe exist.

Another version of the paradox of fiction (discussed by Radford 1975) focuses on the rationality of emotional responses to fiction.

Rationality Paradox[1]

PF1* Our emotional responses to fiction are sometimes rational.

PF2* We do not believe that the characters and situations in fiction exist.

PF3* Emotions are rational only when we believe their objects exist.

Radford's original conclusion was that these emotions are irrational, even if they feel natural and intelligible to us. In the extensive literature on the paradox of fiction, the majority of authors do not think that emotional responses to fiction are irrational, and also believe that emotional responses occur frequently (see Davies 2009 for review), so one or more of the central assumptions of the possibility paradox must be wrong. Walton (1990) denies PF1: emotions elicited by artworks are merely pretend emotions[2]. Fictions are props that people use in games of make-believe, similar to how children use props in pretend games, such as playing house. When watching the movie *Alien* we do not genuinely fear the monstrous alien roaming the spaceship, nor are we genuinely concerned for the crew's safety. While this proposal resolves the paradox (since there are no bona fide emotions involved), it creates its own difficulties. As Carroll (1991) has remarked, for children's games the prop itself does not matter a great deal when creating the make-believe. A patch of leaves can be a castle, a stick a cannon. But for fiction, the artwork does make a great difference in whether or not we are moved. Many horror movies do not elicit fear but ridicule. By contrast, if the emotions are genuine we can easily explain why some horror movies work (because they genuinely horrify) and others do not (because they fail to move us in this way). We cannot at will turn off emotions experienced in response to fiction, something that is not explained by Walton's account.

The second type of response denies PF2: people temporarily suspend their disbelief in the fictional situation they are encountering (Hurka 2001). For the time being, they really believe that, say, Gollum desires the ring. This position seems implausible. Under controlled experimental conditions, fiction tends to elicit higher degrees of emotional transportation (feeling absorbed by the story) than non-fictional

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1 We thank Richard Joyce for this formulation of the paradox.

2 Walton's response also diffuses the paradox as it pertains to rationality, since by denying that we have genuine emotional responses to fiction, he in effect denies PF1*.

(newspaper) reports—and only transportation in fiction, but not in non-fiction, results in higher feelings of empathy (Bal & Veltkamp 2013). Green and Brock (2000) presented identical stories as either factual or purely fictitious. Respondents reported no difference in transportation between these conditions, yet one would expect that suspension of disbelief is easier with stories labeled as factual. Moreover, suspension of disbelief cannot explain why some delight in genres like tragedy or horror that aim to elicit negative emotions. Under experimental conditions, participants who watch a sad film enjoy themselves more when they are more transported by the story (Ahn et al. 2012). This correlation between enjoyment and transportation does not hold up when we learn about real-world sad events, where the opposite is the case.

Given that the first and second statements are plausibly true, most responses to the possibility paradox of fiction involve a denial of PF3, i.e., they argue that existence beliefs are not necessary for emotional engagement with artworks. Lamarque (1981), for instance, proposes that we can really be moved by artworks: we do not enter pretend worlds, as Walton argues, but rather, we let the artworks enter our world. By considering fictional characters like Desdemona, or the nameless woman who is grieving for her dead child in Picasso's *Guernica*, we form thoughts; although such thoughts cannot be objects of pity (and other emotions), they "can be pitiful and can fill us with pity" (Lamarque 1981, 294). Lamarque's proposal solves the possibility paradox but not the rationality paradox: even if it can be shown *why* we have these responses, we have thereby not shown they are rational. Joyce (2000) argues that seeking out movies, books and other media that elicit emotions can be practically rational: when someone watches *Doctor Zhivago*, they plausibly know they will be sad, but if they watch the movie wanting to have this experience believing it will serve their ends, they are rational for watching it.

Supposing the paradox of fiction can be resolved in a way that is philosophically satisfying, it remains "an interesting psychological question why certain kinds of affect persist after one learns of and forms the belief that objects of an emotional response are fictional" (Tullman & Buckwalter 2014, 794). Emotional engagement with fiction is indeed a peculiar feature of human cognition, which, given its cross-cultural ubiquity, requires an explanation in evolutionary terms. In this paper, we will use the tools of evolutionary psychology, broadly construed, to explain emotional responses to fiction. In section 2, we look at some attempts to explain emotional responses in an evolutionary context. Section 3 proposes that fiction is a form of

cognitive engineering. We propose two forms of successful cognitive engineering through fiction which both rely on emotions: the aims of nineteenth-century social reformers to change public opinion by making readers empathize with characters that were not normally part of their social circles (section 4), and the desires of readers and watchers of fiction to achieve transportation, a sense of being absorbed by a story, and in this way, to experience greater wellbeing and happiness (section 5).

2. Explaining emotional responses to fiction in an evolutionary context

Many authors (e.g., Aristotle, Hume, James) have proposed comprehensive theories about what emotions are, and how they could be categorized (e.g., basic emotions, social emotions). There is no consensus about what emotions are, for instance, if they are mainly consciously experienced physiological changes or if they have also cognitive content, nor is there consensus about what affective states count as emotions. In spite of this lack of definitional clarity, emotions have become an important field of study. Most evolutionary psychologists in the broad sense understand emotions as relatively short-duration states that involve physiological factors, such as muscle tension and cardiovascular changes, facial expressions, as well as attention and higher cognition. Emotions are crucial for how people approach social relationships, and for long-term health and wellbeing.

Darwin (1872) was the first to propose an evolutionary, functional explanation for emotions: they help to prepare an animal for appropriate actions and to effectively communicate inner states, such as distress or anger, to others. Some evolutionary thinkers (e.g., Nesse 1990) argue that emotions are cognitive and physiological states that are shaped through natural selection. They contribute to fitness by helping an organism respond appropriately to threats and take advantage of opportunities. For example, anger directs blood away from internal organs towards arms and hands, and increases blood pressure, which is useful for direct confrontation in combat. Others (e.g., Keltner & Haidt 1999) have stressed the social effects of emotions: emotions, such as anger and embarrassment, influence other people; perceiving emotions plays a key role in social interactions, such as courtship and reconciliation. Displays of emotions, such as pride and embarrassment, help to negotiate group status and social roles. For example, embarrassment signals that someone is aware they have made a social gaffe that they are unlikely to repeat in the future, which may prompt others in

the group to forgive them. Frank (1988) has hypothesized that moral emotions serve as "commitment devices", compelling people to cooperate in social situations where there is a temptation to defect, and signaling to others that one can be trusted in doing so.

Emotions elicited by fiction, and by art more broadly, do not fit neatly in these evolutionary scenarios. The situations depicted do not really occur, so how could emotional responses to fiction be adaptive? This problem can be termed *the evolutionary paradox of fiction*, which consists of a tension between the following three claims:

EPF1 We have genuine emotional responses to fiction.
EPF2 Emotions are functional adaptations that help us respond to threats and opportunities in our environment which impact our fitness.
EPF3 Social and other situations depicted in fiction do not impact our fitness.

There have been several attempts to resolve this paradox. One is to deny EPF1, that is, to argue that there is a qualitative difference between emotions elicited by artworks and those evoked by analogous real situations. Goldstein (2009) noticed a large difference between imagined and real (remembered) experiences. Adults who compared their experience of a gloomy film to an unhappy personal event experienced similar levels of sadness, but felt considerably less anxious watching the movie compared to recollecting personal experiences. This does not make the emotional responses to fiction any less puzzling though, since levels of sadness were similar, which seems prima facie not an adaptive response to a fictional situation (why be sad if nothing sad really happened?).

Other authors qualify EPF2 by examining what happens when people emotionally respond to fiction. For example, Young (2010) draws on theoretical work by Paul Ekman and Paul Griffiths to argue that some emotional responses are involuntary and unconscious, and as a result do not always agree with our consciously held beliefs. Such emotions are elicited when the appropriate stimulus is present, regardless of our higher-order beliefs. In this way, emotions are indeed functional adaptations that help us respond to our environment, but as they are triggered automatically and, in the case of fiction, inappropriately, they do not always impact fitness. Emotions are adaptive responses to type events, e.g., jealousy makes us

vigilant for potential partner infidelity, but things can misfire in particular token events, e.g., Othello wrongly believing his wife to be unfaithful. Perhaps emotional responses to fiction fall in this category of evolved emotions "misfiring" in particular token situations.

The most common way to resolve the evolutionary paradox of fiction is to deny EPF3. Sugiyama (2001) and Tooby and Cosmides (2001) have proposed some form of the following thesis: narratives provide a simulation of real-world experiences that allow listeners to engage in vicarious learning. As Mar and Oatley (2008, 176) put it "Works of imaginative literature— stories—are one means by which we make sense of our history and our current life and by which we make predictions and decisions regarding our future world" (see also Steen & Owens 2001 who connect fiction to mammalian adaptations for play and imagination; see further [Chapter by Bateson]). Emotional responses help to make the learning experience more compelling. In this way, the emotions elicited through fiction are adaptive. Sugiyama (2001, 2011) compiled cross-cultural evidence showing that folktales in hunter-gatherer societies often contain foraging information; there may have been multiple selective pressures for the transfer of information between older and younger members of a group through means of narrative: children and adolescents can vicariously learn about subsistence strategies through stories (e.g., what to do if there is a drought).

Tooby and Cosmides (2001) also argue that fiction provides a risk-free environment where we can engage in vicarious learning. Confronting a lion in the real is a frightening experience; hearing a story about a predator (*Little Red Riding Hood*), or watching a predator in a movie (*Jaws*) is scary too, but we do not have the associated flight reactions. In this way, such stories are helping us assess the dangers of predators and offer appropriate responses. Tooby and Cosmides point to several features of storytelling, including its emotional involvement, as evidence that fiction is adaptive. The emotions elicited by fictional accounts augment our involvement with stories and increase our capacity to learn from them. Readers of Jane Austen's *Pride and Prejudice* feel relief when Elizabeth rejects Mr Collins, who stands to inherit a fine estate but is a rather silly man (resources but no mate quality), and rejoice when she finally accepts the rich and high-principled Mr Darcy, sentiments that support judicious partner choice (resources as well as mate quality). Stories may also help to instill correct social behaviors and moral values, as in the Hindu

Panchatantra (compiled around the 3rd century BCE), animal fables that are meant to instill *nīti* (wise conduct). For example, in the story *Aparīkṣitakārakaṃ* ("Rash action"), a Brahmin leaves his infant son in the care of his mongoose friend. Upon his return, the child has vanished, and the mongoose has blood on its snout. The Brahmin immediately assumes the mongoose has savaged his son, and kills the animal. However, he later finds that it defended his infant, who is alive and well, from a snake attack. The vicarious remorse the reader or listener of this tale feels instills a state of mind that guards against drawing hasty conclusions and acting rashly upon them. Variations of this story are widespread, e.g., the Welsh legend of Gelert the dog.

While there is significant corroboration for the claim that fiction supports vicarious learning, this proposed function seems quite narrow when we consider the breadth and scope of fiction. Next to learning, people also engage in fiction for other reasons. For example, most readers of young adult fiction (fiction ostensibly aimed at readers aged 12 to 17, including such titles as *The Hunger Games* and *Twilight*) are adults. Presumably, adults enjoy these novels, which typically have less complicated plotlines, lots of dialogue, and engaging and straightforward storylines and characters, as a form of escapism from the drudgeries of work, commuting, and childcare. There is undoubtedly some vicarious learning at work in reading young adult literature. For example, one consistent theme in the *Harry Potter* heptalogy is helping misfits. Vezzali et al. (2015) found that children and adults who read these books exhibit less prejudice towards outgroup members (e.g., immigrants, gay people), an effect mediated by the extent to which they identify with its eponymous character. But engaging in young adult fiction, and the emotions it elicits, is more than vicarious learning—as we will argue, emotions in fiction can be marshaled for several functional goals, one of which is pure enjoyment.

3. Emotional responses to fiction as a cognitive technology

To understand the role of emotions in fiction, it is important to look at the motivations of both authors and consumers (readers, listeners, watchers, etc.). Why do they produce or consume fiction; what, if anything, do they hope to accomplish with it? Is the ability of works of fiction to move their audience a design feature? If it is, we can conceptualize the ability of narratives to elicit emotions as a form of cognitive engineering or cognitive technology.

Technologies are ways in which organisms alter their environment. Pragmatic technologies meet pragmatic, practical ends, i.e., transformations of the physical surroundings. Cognitive technologies are not specifically aimed at altering our physical surroundings (though they may sometimes result in this), but at transforming our cognitive environment, including its epistemic and affective properties. For example, number words form a cognitive technology. As our evolved capacities for number discrimination are limited to 3 or 4, number words allow us to do something we would not be able to do otherwise, namely precisely denoting the cardinality of larger collections (Frank et al. 2008). Or take the use of calendrical notation systems as a way to predict cyclically occurring events. Our evolved systems for keeping track of time are quite fine-grained in the short term, but it is hard to keep track of relatively rare events that occur cyclically over the long term, such as the timing of herd migrations, the spawning of fish, or the flowering of trees (De Smedt & De Cruz 2011). Calendars help to lift these cognitive limitations by keeping track of such cyclical events, which may explain their prevalence in human cultures since 30,000 year ago, long predating the invention of writing.

The examples of number words and calendars indicate two important ways in which cognitive engineering is achieved: language and material culture. Language can provide a 'handle' for attention, allowing us to focus on properties of the environment that would otherwise elude us (Jackendoff 1996). Material culture can help overcome cognitive constraints caused by limitations in memory (by providing external memory) and in conceptual stability (helping to stabilize concepts that would otherwise fluctuate, e.g., depictions of supernatural beings). Fiction not only uses the cognitive engineering potential of language, but often also of material culture. For example, to enhance the pageantry and immersiveness[3] of a play, actors often use costumes, masks, makeup, and decors.

Regarding fiction as a cognitive technology is consistent with a wide range of motivations for why people consume and produce stories, ranging from deriving unadulterated enjoyment to effecting societal change. We will discuss how fiction can be seen as a cognitive technology by focusing on two motivations for engaging in fiction. The first case study looks at fiction from the perspective of an author, showing how writers such as Charles Dickens and Elizabeth Gaskell used their novels

[3] "Immersiveness" is a term from game design, meaning more than immersion; it refers to an interactive, multi-sensory experience of the narrative.

to sway public opinion in the direction of social reforms. The second case study looks at why readers and watchers enjoy fiction that transports them into fictional narrative worlds.

4. Expanding empathy and prosocial behavior through the social novel

Social novels (also known as social protest novels) highlight problematic social circumstances, such as extreme poverty, slavery, or animal cruelty. By making their public aware of dire circumstances, they aim to marshal public opinion for social change. The genre particularly flourished during the 19th century. Dickens' novels *Bleak House* and *The Life and Adventures of Nicholas Nickleby*, that highlighted abject living conditions and lack of medical care for the poor, helped support numerous social reforms that led to better living conditions in the UK. Harriet Beecher Stowe's *Uncle Tom's Cabin* played a pivotal role in the abolitionist movement in the United States in the 1850s. Ann Sewell's *Black Beauty* has as narrator and protagonist a horse that goes from a relatively carefree life as a farm animal to the strenuous life of being a taxicab horse. Black Beauty is unabashedly anthropomorphic, yet the book is also rich in details about horse behavior and handling. As a direct result of the novel, bearing reins (which forced a horse's head in a constant high position that was regarded as aesthetically pleasing, but that was awkward and painful for the animal) were forbidden in Victorian England.

How do novels effect social change? Literature can be used as a cognitive technology to decrease the limitations of empathizing. Empathy is an important catalyst for prosocial behavior, but it is limited in scope. Humans find it easier to empathize with single identifiable individuals than with large numbers of nameless victims, and they are subject to similarity bias, being less able or willing to empathize with those who are different from themselves. In one study (Xu et al. 2009), Chinese and Caucasian college students witnessed people receiving a painful stimulation (a needle prick) or a neutral control stimulus (a touch with a Q-tip). Participants had to judge how painful the stimulus was while their brain was scanned using fMRI. The anterior cingulate cortex (ACC), which is involved in perceiving one's own pain as well as that of others, was more activated when participants saw the needle prick compared to the touch with the Q-tip. However, the ACC showed larger responses when seeing pain inflicted on people from the same racial group—this effect was

similar in Chinese and Caucasian participants. In another study (Stürmer et al. 2006), German male Muslim and non-Muslim college students received a plea for help (to find short-term accommodation in town) from either a Muslim ("Mohammed") or a non-Muslim ("Markus") fellow student. In both groups, empathy only predicted helping intentions when the helpee was an ingroup member, but not when he was an outgroup member. Such findings can explain why people who are in a position to help fail to aid those who are part of marginalized outgroups.

Social novels reduce similarity bias by decreasing the perceived difference between ingroup and outgroup members through several narrative techniques. One particularly effective, yet simple technique is to cast an outgroup member as the protagonist. Drawing on empirical research on discourse processing, the literature scientist Mary-Catherine Harrison (2011) finds that people tend to empathize more with the protagonist of a story than with secondary characters. Novelists frequently use the technique of foregrounding, "a kind of privileged focus that establishes the status of a protagonist within a text" (Harrison 2011, 266), for instance, by devoting more text to describing the thoughts and actions of that character, or by granting more introspective access to her inner states. As a result of this focus, readers can overcome the perceived otherness of outgroup members, and realize that they have a lot in common with characters who do not belong to their social circle. Authors do this by de-emphasizing differences, such as race, gender, or class, and by focusing on shared emotions, such as hopes and fears. For example, in Gaskell's *Mary Barton*, middle-class readers are invited to empathize with working-class characters by highlighting common concerns, such as dealing with unrequited love, losing a child, and choosing to marry for material convenience or for love.

5. Transportation and enjoyment

When looking at fiction as a cognitive technology, we need not only consider the producers of fiction, but also its consumers. Reading or watching a story is not a passive affair, but an active, reconstructive process. As fantasy and science fiction author Lois McMaster Bujold (2013) puts it, "The book, if you like, is not the story but merely the blueprint of the story, like the architect's drawing of a house. The reader, then, is the contractor, the guy who does the actual sweat-work of building the

dwelling. From the materials in his or her head, the ideas, the images, the previous knowledge, each one actively reconstructs the story experience."

We will now briefly look at two motivations that readers have for engaging in fiction: experiencing different times, places, characters, and events, and escaping from their everyday lives. Both are achieved by transportation. Transportation is a metaphor coined by the cognitive scientist Richard Gerrig (1993) to describe the subjective sense of being absorbed and immersed in a story. Transportation into a narrative results in reduced attention for one's surroundings and a diminished focus on oneself, and greater attention for the narrative. It involves a complex amalgam of emotions, mental imagery, and attributions of mental states (Green & Brock 2000). There is convergent evidence (see Green et al. 2004 for a review) that transportation contributes to enjoyment, which is an important motivation for readers and viewers to engage in fiction. Negative reviews of books on Goodreads frequently bemoan a lack of transportation ("I just couldn't get into the story"), whereas positive reviews hail it ("The book gripped me from the beginning. I couldn't put it down"). If transportation is indeed a desirable state, and if fiction can help to accomplish it, two questions arise. How does fiction result in transportation, and why does transportation contribute to happiness and wellbeing?

Narratives create a sense of transportation by keying in on our evolved ability for self-projection. Neuroimaging studies have identified a common neural network (including medial prefrontal, medial temporal, and medial and lateral parietal regions) involved in retrieving personal memories, predicting personal future events, attributing mental states (theory of mind), and navigation (Buckner & Carroll 2007). These cognitive faculties are usually studied separately, but a meta-analysis (Spreng et al. 2009) revealed that there is an extensive functional overlap between them. Intriguingly, the same network is also active when participants are in a conscious resting state, the so-called *default mode network* (DMN) (Buckner et al. 2008). Buckner and Carroll (2007) propose that all the tasks carried out by the DMN require some form of self-projection. The self-projection theory provides a unified account for why an integrated functional network can perform such seemingly diverse tasks as remembering, predicting, navigating, and attributing mental states. When we remember an event in our personal past, we place ourselves in that situation and reimagine visual, tactile, olfactory, and other features of the event. For example, when Marcel Proust (1913) ate a madeleine cookie dipped in tea, it brought a host of

childhood memories back to mind. When we think about our personal future, we project ourselves in a future state. When we imagine a hypothetical situation, such as visiting a museum, we project ourselves spatially, emotionally, temporally. A study with patients who were unable to recall personal memories found they were also unable to project themselves in hypothetical situations, such as lying on a tropical beach (Hassabis et al. 2007).

Several neuroimaging studies indicate that narrative comprehension, such as reading Aesop's fables (Xu et al. 2005), or nursery rhymes or vignettes made up by researchers (AbdulSabur et al. 2014), engage the DMN. Tamir et al. (in press) looked specifically at the components of fiction that contribute to activity in the DMN. They found two types of features that increased activity in brain areas that are part of the DMN: vivid descriptions of scenery led to increased activation compared to generic texts, especially in the medial temporal lobe subnetwork, and narratives that described social interactions resulted in greater activity in the dorsomedial prefrontal cortex. Additionally, several studies indicate a deep and sustained involvement of theory of mind in narrative processing, for example, performance of theory of mind tasks is improved in frequent readers. Mar et al. (2006) found a positive correlation between being a long-time reader of fiction, especially someone who is often transported into stories, and social acumen and empathy. It is difficult to tease apart cause and effect in this study—maybe people with a keen sense of social interactions are more drawn to literature. Under more controlled conditions, Black and Barnes (2015) found that after reading fiction participants perform better on theory of mind tasks, but not on intuitive physics tasks, compared to participants who read a non-fiction piece of similar length.[4]

Taken together, these results support our following tentative hypothesis: the experience of being transported into a story is a result of an increased engagement of the DMN, which is otherwise mainly engaged in everyday self-projection activities, which happen spontaneously when one is not overtly focused on the external world. As originally coined by Gerrig (1993), transportation was a spatial metaphor, pointing to fiction's ability to mentally place readers in a different location. But if the activity of the DMN results in the phenomenological sense of transportation, it not only

[4] This latter study is a replication and extension of Kidd and Castano (2013), which reported improved performance in theory of mind tasks when reading fiction. However, it also proposed that so-called high literature is superior in improving theory of mind performance compared to popular fiction. This part of the study could not be replicated.

involves a spatial component but also emotional and other elements. While better theory of mind comprehension is a salutary effect of reading fiction, it is not the main motivation for consumers of fiction. Instead, they enjoy transportation, and read or watch in order to be transported, even for a short while, in another world, inhabited with fictional characters —as one respondent to a Pew Forum survey[5] on reading put it, "being able to experience so many times, places, and events."

A sustained engagement of the DMN contributes to feelings of wellbeing and happiness as it counters rumination and other forms of self-reflection, which are also subserved by the DMN. Several studies (see Mor & Winquist 2002 for a meta-analysis) show an overall negative effect of self-directed thought on wellbeing: reflecting on one's past, future, or things one could have done differently (counterfactual thinking) on the whole result in lower happiness and increased anxiety, the only exception being when one thinks of oneself in a very positive light, following a positive life event (e.g., a promotion at work). On the whole, self-directed thought includes a lot of negative elements, which even deliberate attempts to think positively about oneself cannot completely avoid (Nolen-Hoeksema et al. 2008). Transportation can enhance wellbeing by directing the functional activities of the DMN to the fictional world and its characters, away from one's own situation and life. When we are absorbed in thinking counterfactually and theorize about fictional characters (What if Emma Bovary hadn't married her boring country doctor?), we cannot at the same time ponder our own situation and life (What if *I* didn't have this boring job?). While we are consciously aware of the fact we are reading a novel or watching a movie, the DMN is not aware of this, and is instead playing out what we are reading or watching. In this way, transportation can make consumers of fiction happier, as their attention is drawn away from negative self-directed ruminations. This explanation of the functional role of transportation also clarifies why emotions elicited through stories, including negative ones, may contribute to a positive evaluation of artworks. Since Aristotle, philosophers have wondered why tragedies are enjoyable to watch, in spite of their sad situations and the feelings of empathy one has for the unfortunate characters. Fiction that elicits deeper emotions achieves higher degrees of transportation, regardless of whether such emotions are negative or

[5] http://www.pewinternet.org/2012/04/05/why-people-like-to-read/

positive. This may explain the observation of Ahn et al. (2012) that watchers of sad movies feel more enjoyment when they are more transported in a narrative.

6. Conclusion

The paradox of fiction queries why people are emotionally moved by fictional situations and characters, while they know these are imaginary. Some versions of the paradox (notably Radford 1975) ask whether being emotionally moved by fiction can ever be rational. In this paper, we have examined the paradox of fiction from an evolutionary point of view. Emotions elicited by fiction do not neatly fit evolutionary explanations of emotional responses. It would seem that fictional situations do not directly impact our fitness, so how can emotional responses to fiction be adaptive? In this paper we have argued against this supposition (i.e., we reject the claim that emotional responses to fiction do not impact fitness), but argue that such responses are deliberately sought or engineered by producers and consumers of fiction. Fiction can be regarded as a cognitive technology that engenders emotions that are pursued by the readers or watchers. Some authors use narrative techniques to elicit empathy in order to transform the attitudes of readers to outgroup members. Some readers use fiction to achieve transportation, which helps them to be mentally situated in a different realm, or to escape their everyday existence and associated ruminations.

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