

The mind's flight simulator

Keith Oatley shows that fiction is not just entertainment

People spend a good deal of their free time on novels, plays, films and television dramas. What are they up to? Being entertained, perhaps. But is there more to it? Maja Djikic, Raymond Mar and I have been working together to understand the psychological effects of engaging with fiction.

Our small group's research starts with the idea that fiction is not simply a set of defective descriptions made by unreliable observers. Our hypothesis (Oatley, 1999) is that fiction is a kind of simulation that runs on minds. With the importance that simulations now have in cognitive psychology, fiction takes on new significance.

Fiction is simulation in two senses. First it is simulation in the sense that researchers on theory of mind such as Harris (1992) talk about it. In ordinary life, we use aspects of our understanding of ourselves to infer what others might be thinking and feeling. In fiction, authors offer us cues to our theory-of-mind processes, so that we can use these same simulative faculties for fictional characters. Recently, the literary theorist Zunshine (2006) has argued that fiction is largely about theory of mind, which we are good at; so we enjoy fiction because we like doing what we are good at.

The second sense of simulation concerns complexes. When we want to understand a

complex – processes in interaction – then it is useful to write a simulation. We can often understand individual processes quite well, but their interaction and emergent properties are more difficult. We can, for instance, understand that carbon dioxide traps heat in the earth's atmosphere. But it has taken computer simulations to convince us that the interaction of this process with others is contributing to the trajectory of our planet towards deleterious climate change. The social world is also a complex. If a certain Elizabeth Bennet wants to get married and attends a dance, we can readily understand that she will want to dance with eligible men. But what if extra elements are added? What if the most eligible man in the room acts in a way that is proud and standoffish? This is what happens at the beginning of Jane Austen's *Pride and Prejudice*. Authors of

fiction write simulations that follow the trajectory of such possibilities. We enter the goals of a character such as Elizabeth into our own planning processors, and as her plans meet vicissitudes that the author indicates, we experience emotions. Not Elizabeth's emotions, but our own, in the contexts the author has prompted us to imagine ourselves into.

If one learns to fly, it may be a good idea to spend time in a flight simulator. A prediction of the hypothesis that fictions are typically simulations of the social world, therefore, is that people who spend time reading them will become more socially skilled than people who read non-fiction. Mar et al. (2006) tested this prediction. We measured whether participants read predominantly fiction or non-fiction. Participants took two tests of social ability. One was Baron-Cohen et al.'s (2001) Mind-in-the-Eyes test, in which people look at photographs of faces with just the eyes showing, as if seen through a letter-box. Each set of eyes displays a distinct facial expression, and participants choose from four descriptors, for instance: 'joking', 'desire', 'flustered', 'convinced'. This can be thought of as a test of adult theory of mind, or of empathy. The second test was the Interpersonal Perception Task (Costanzo & Archer, 1993), a set of 15 video clips of ordinary people in interaction. For each, the participant has to answer a question about what is going on. In one clip the participant has to say which of two children in the scene, or both, or neither, is the offspring of the two adults in the clip. The results showed that people who read predominantly fiction were substantially better than those who read predominantly non-fiction at the Mind-in-the-Eyes test, and somewhat better at the Interpersonal Perception Task. These effects were not attributable to individual differences. Mar (2007) has also shown that, after random assignment of people to read either a fiction piece or a non-fiction piece from the *New Yorker*, those who read

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the fiction piece scored higher on a test of social reasoning, although there were no differences between the conditions on a test of analytical reasoning.

The term simulation has also been used by Gilbert (2006) in his book *Stumbling on Happiness*. He shows that we are pretty bad at using our imagination to simulate the future. In one of his experiments, described in the book, some volunteers receive a gift certificate to an ice-cream parlour, have to do a long boring task, and then report how they feel – generally less than ecstatic. A new group of volunteers is then told about the task and that they will receive a prize. Some of them, whom Gilbert calls simulators, are told what the prize will be, and they have to imagine how they will feel after getting the prize and completing the task. The others, whom Gilbert calls surrogators, are not told what the prize will be, and they have to predict how they will feel based only on a randomly selected report from the first group. Next, simulators and surrogators receive the prize, do the task, and are then asked how they actually feel. On average simulators felt worse than they predicted – their imagination failed to grasp how quickly the long, boring task would cancel out the pleasure of getting the prize – whereas the surrogators felt much as they predicted.

Gilbert says people don't know themselves very well, and they are not good at taking the right things into account in their simulations. The implications are severe, because humans are future-oriented beings, who generally use their imagination to simulate the future.

But perhaps we should not say, 'Look how bad people are at this.' Perhaps we should ask: 'How might we improve?' One way is to learn from experience. Gilbert offers another way: consult people who have had experiences in which we are interested. We certainly do this, in conversations. In its explorations of the

what-ifs of social life, fiction offers more experience and more consultations than we could otherwise have. So, rather than giving up on the simulative imagination, as Gilbert recommends, the view of our research group is that predictive simulation might be improved by reading fiction. As Proust writes in *In Search of Lost Time*, the novelist 'sets loose in us all possible happinesses and all possible unhappinesses, just a few of which we would spend years of our lives coming to know'.

"we hypothesise that frequent reading of literary fiction can facilitate the development of selfhood"

What of the reader's own sense of selfhood in the present? Does fiction help here, too? Maja Djikic et al. (in

press) randomly

assigned people to read either a short story by Anton Chekhov – 'The lady with the little dog' – or a version rewritten in a non-fiction format. The story, first published in 1899, is generally regarded as one of Chekhov's greatest. It starts in the seaside town of Yalta, with a holiday affair between a man and the lady who has the little dog. The version in non-fiction format was written by Djikic from Chekhov's story, as a transcript from a divorce court, with the same characters, the same events and some of the same conversational exchanges. It was the same length as Chekhov's original story, the same level of reading difficulty, and participants rated it as just as interesting, though not as artistic. Before and after reading, participants had their personality traits measured and they rated the intensity of 10 emotions they were currently feeling on 0 to 10 scales.

Djikic et al. found that readers of Chekhov's story experienced changes in their personalities that were greater than those of the readers of the courtroom account. The changes were modest, but they were significant, and they were not all in the same direction. They were idiosyncratic, and mediated by the

Recognising resentment

The usual interpretation of William Shakespeare's *Othello* is that its principal character, Iago, is a psychopath, an embodiment of evil, from whom one should shrink in horror. In Oatley (2009) I argue that Shakespeare's play can be read just as plausibly, and for psychologists more interestingly, with Iago not being a career criminal but a career soldier.

Iago is a non-commissioned officer, Othello's third-in-command. A space opens for lieutenant, second-in-command. But despite recommendations from 'Three great ones of the city,' and despite Iago's intelligence, military skill, experience, and loyalty, Othello, his long-time commanding officer, passes him over and appoints as lieutenant an outsider of higher social class who has no combat experience. Iago experiences resentment.

By entering the simulation and identifying with Iago, we can not only experience an emotion that is so nasty that it is difficult to own up to, but we can follow some of the effects of resentment in ourselves, recognise some of its implications, and become able to discuss it with others.

emotions that participants felt while reading. We believe that part of this effect occurred for readers of Chekhov's story as they experienced empathy with the two protagonists, and became a bit more like them. Their habitual ways of being loosened up. No doubt much of the effect was temporary, but we hypothesise that such effects cumulate, and that frequent reading of literary fiction can facilitate the development of selfhood.

The findings of our group discussed here are reviewed at more length by Mar et al. (2008). These studies, along with those of Hakemulder (2008), indicate that reading fiction can have psychological effects. Thus, the arguments advanced from the time of the classical Greeks – that fiction is serious – gains, for the first time we believe, some empirical basis. Though we have worked with reading, we have no reason to suppose that comparable effects would not occur with films and plays.

Further implications

The main use of fiction in psychology until now seems to have been to supply writers of textbooks with verbal

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illustrations when photographs would not do. But suppose fiction has psychological functions as discussed above and as Mar and Oatley (2008) have proposed. Suppose we were to regard it, in the manner of cognitive psychology, as a kind of simulation that can have interest for psychological research, what further implications might this have?

One implication is that, because fiction induces emotions in readers, psychologists could use this in the study of emotions, in the kind of way that researchers in perception use demonstrations of stereoscopic figures, localisation of sound, illusions, and so forth. Such demonstrations are designed to be instructive about perceptual processes. Many fictions are instructive about emotions: for an example see the box on the previous page.

A second implication is for the study of moral reasoning. Recently, a burst of growth has occurred in a field invented by Foot (1978) that uses vignettes in which a trolley (wagon) rolls out of control towards a set of points so that, depending on how the points are set, it will kill either one person or five people.

What should one do, if one could switch the points?

Interest in 'trolleyology' has become quite intense in both philosophy and psychology (e.g. Waldemann & Dieterich, 2007). But what if, instead of vignettes, we were to consider short stories or films, written by the best artists, of situations that are unusual enough to prompt people to think, but recognisable so that people can enter into them and identify with the protagonists. The film director Krzysztof Kieslowski has explained (in the introduction to Kieslowski & Piesiewicz, 1991) that in making the 10 one-hour films of *The Decalogue* his purpose was explicitly of this kind. He wanted to depict ordinary people in moral dilemmas that would enable viewers to think about them.

In *Decalogue II*, for instance, a doctor is asked by the wife of a man who is very ill whether her husband will soon die. The woman loves him, but she is pregnant by another man whom she also loves. If her husband will live, she says she will have an abortion. If he will die, she will not. Should the doctor give his opinion on the man's chances and

thereby affect the woman's decision on the abortion? And what should the woman do?

Foot introduced trolley problems to help clarify our thinking about abortion, in which our intuitions sometimes involve what she calls a double effect in which people intend one thing, for instance to save the life of a woman, but at the same time cause something else, for instance the death of a fetus. Might films or short stories be better than vignettes because they are more realistic, and because they are simulations that allow us to think about several processes in interaction?

Of course, if we psychologists insist on seeing fiction as frippery, these suggestions will seem inappropriate. But if fiction is a set of simulations of the what-ifs of social life, what if a rapprochement is taking place between psychologists and literary theorists?

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