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# Imagining, Fiction, and Narrative

The radical simplification of at least some branches of cognitive science is that instead of studying human beings in all their complexity, we look at cognitive agents (computer programs or robots) of which we have, at least in principle, a complete understanding. A cognitive agent is capable of certain perceptions and actions, and it is assumed to have goals and beliefs, which are encodings of logical expressions in a formal language. There are computational "inference" processes which operate on the logical expressions. Goals and beliefs are distinguished by the processes that operate on them; the processes act as though the beliefs were true and seek to find actions that will make the goals true. We as programmers, when we construct the cognitive agent, know the semantics of its formal language, and we link up the expressions with sensory and effector processes in the right way, given the semantics. After the agent has been embedded in a world for a while, it will acquire new beliefs, beyond what we have given it, and there will be a causal story, involving perception and inference, that will account for its "noninnate" beliefs. In our use of this idealization, we ask how much of the full complexity of human action we can construct out of such simple elements. Where we succeed, the result is not an account of how things actually are but only a proof of possibility.

This variety of cognitive science, proceeding in this manner, has made substantial progress toward an understanding of people's ordinary, everyday linguistic capabilities and activities. It has had less to say, however, about people's out of the ordinary, literary activities and achievements. In this chapter I would like to speculate a bit on whether the framework of cognitive science could lead to a better appreciation of the role of literature in human life. I will consider successively the possible functions that imagining, fiction, and narrative might have for a collection of communicating cognitive agents embedded in a world.

The imagination can be modeled as a set of logical expressions that are very much like beliefs in that they enter into the inferential processes in much the same way—hypotheses, for example, may be viewed as a kind of imagining—but with three crucial differences.

First, imaginings must be conscious, whereas beliefs may be unconscious. Cognitive science has little to say about the subjective experience of consciousness, but two features of consciousness can and should be modeled, the knowledge of one's own beliefs and "focus." In order to make inference processes computationally tractable, it helps to assume that some beliefs, including many recent perceptions, and some goals are in focus. Inference processes operate primarily or preferentially on the beliefs and goals in focus. In our radical simplification many properties of consciousness translate into properties of focus. Expressions that are imagined must then be in focus, whereas beliefs need not be. Walton (1990) disagrees with this, giving the example of a man who imagines his retirement consciously and unconsciously imagines that he is in good health when he retires. This is unconvincing, however. It is difficult to imagine a single proposition, just as it is difficult to believe a single proposition. Rather, we imagine and believe large complexes of propositions, and I would say that in his imaginings about his retirement, the man imagines in addition some properties that he himself would have, including the property of being intact.

The second difference between imagination and belief is that we cannot expect to tell the same kind of causal story for imagined propositions as for beliefs. Perceptions and inference cer-

tainly play a role in the origin of imaginings, but the tight connections required for belief need not be there, and in fact if they are, we are likely to call the proposition not imagined, but believed.

Third, the agent will not act as though imagined propositions are true. While the normal planning processes may be applied to imaginings just as they are applied to beliefs, the agent will not perform the indicated actions, or at least will not perform them in the expectation of achieving real goals.

There are at least two roles imagining plays in a person's life, that translate into corresponding possible roles in a cognitive agent's life.

1. We imagine things as a way of problem-solving by analogy, often as practice for or in order to work out solutions in leisure for situations that may arise in the future. The day before the Super Bowl at Stanford in 1984, the referees were out on the football field alone, pretending they were watching a play, and then pulling out the flag, trying to imagine every conceivable problem beforehand, so that during the Super Bowl their reactions would be immediate and reliable. The agent would similarly use time when no immediate action was required, to imagine or hypothesize problematic situations in order to work out the solutions beforehand and precompile them for rapid deployment should the situation arise in reality. Much play is of this nature. An agent that is intelligent enough to modify its environment will inevitably construct a world which, most of the time, is benevolent enough that the full capacities of the agent are not needed. At that point, the excess intelligence can be devoted to problems and activities that have no real consequences. That is, the agent will play. Often in play, we are working out the solutions in nonconsequential situations to simulated problems that we may sometime encounter in reality. This is a common observation about play.

2. Imaginings give us pleasure, make us angry, and evoke various other emotional reactions. Cognitive science has had little to say about the subjective experience of emotion. But we can talk about the combinations of beliefs and goals that are associated with various emotional states. Thus, pleasure is associated,

among other things, with a focused belief that one's goals will be fulfilled. The (very) radical simplification of emotion is then to identify the emotions with these goal- and belief-states. Under this view, the emotional reaction to imagining becomes very curious. The view suggests that belief is not crucial, that imagining is sufficient. Pleasure is associated with *any* focused proposition whose content is that goals will be fulfilled, whether the proposition is believed or just imagined. It is as though the emotional responses were not hooked up with goal- and belief-states quite right. It is possible that this function of imagination can be reduced to the first function, however. Insofar as the function of emotion is to impel us to generally appropriate actions without extensive reflection, often in situations in which there is no time to reflect, the emotional response to imagining can be seen as part of the analogical problem-solving process. We imagine a situation and perhaps practice a response, and the emotional reaction mediates between the imagining and the response, simply because that's the way it works in real situations.

A paraphrase of Horace's view of the function of literature provides a summary of all this: We imagine things to instruct and delight ourselves.

Let us now suppose we have a society of such cognitive agents. The society is constituted by conventions, or mutual beliefs, that arise from communication, agreements, and copresence, among other things. A mutual belief that  $P$  among a set of agents  $S$  occurs when each of the agents in  $S$  has a belief, that is, a logical expression of the form, say, *mutually-believe*( $S,P$ ), together with the proper associated axioms for the predicate *mutually-believe*, allowing, for example, an agent to conclude individual belief from mutual belief. (If a society of agents discovered by communicating their experiences to each other that there were large areas of coincidence in their beliefs, thereby creating large areas of mutual belief, one can see that "truth" would be a useful concept for them to have.)

Mutual imagining, then, is like mutual belief except that it bottoms out in imagining rather than belief. That is, a set  $S$  of agents mutually imagines  $P$  when each of the agents in  $S$  imagine  $P$ , and they each believe that they all imagine  $P$ , and

they each believe that they all believe that they all imagine *P*, and so on. The origin of any instance of mutual imagining will be either an explicit agreement or an implicit agreement by virtue of conventions in the society of agents. The functions of mutual imagining parallel the functions of imagining for the individual agent—cooperative problem-solving and “enjoying the pleasure of one another’s company.”

Mutual imagining raises the problem of how the rules of the game are to be communicated efficiently. How is it established exactly what is to be imagined? First of all there will be explicit provisions for the occasion. In one of Walton’s examples, Jenifer says to Jason, “Let’s pretend stumps are bears.” Then there will be genre conventions. In certain games a long stick can always be a rifle; we needn’t state that explicitly. But we cannot simply add these provisions to our belief systems, for that would likely result in inconsistency. For example, rifles have hollow barrels and sticks don’t. What other changes need to be made to one’s beliefs to carry on the imagining? A first guess would be that one makes the minimal change required to restore consistency. After all, the vast bulk of our knowledge is still appropriate; trees are still trees. This answer is of course unsatisfactory until a measure of minimality is defined reasonably precisely. Moreover, there may be several ways to reestablish consistency in one’s beliefs that are of roughly equal measure. Consider the example of a cartoon: We learn that mice and ducks can talk, but dogs can’t. What is the minimal change? One possibility is just that: mice and ducks can talk, and dogs can’t. Another is that pets can’t talk and other animals can. Another is that animals that walk on two legs can and animals on four legs can’t. The rule we adopt will come into play when a bear comes on the scene. Can it talk or can’t it? Even in solitary imagining the problem of what needs to be changed in the knowledge base arises. If a man imagines winning the lottery, he imagines the world to be otherwise the same. If he imagines having a harem, he has to make more substantial changes in his belief system.

Fictional discourse is an invitation to mutual imagining, in which the author provides explicit propositions to be imagined and the audience makes what they take to be the necessary min-

imal changes to the set of mutual beliefs the fiction is to be interpreted with respect to.

Most fictions are located in a tradition that sets the conventions about what is to be imagined and what is not. In realistic and romantic novels, for example, we are only to imagine those things that could be true for all we know. Thus, we can imagine that there was a person in Dublin called Leopold Bloom with all the described and narrated properties, but we would object if we were told that the British sovereign at the time was not Queen Victoria but King Victor. In science fiction, we can appeal to possible future technological progress to overcome inconvenient facts, such as the fact that habitable planets are vastly distant from each other being overcome by travel faster than the speed of light. Learning what these conventions are is part of what it is to become a full-fledged member of a culture, a part of what it is to come to have the right belief systems for the particular society of agents.

Certain works of fiction play games with the audience by challenging the conventions it expects to be operative. Fellini's movie "8 1/2" begins with the main character flying through the air. This event sets the viewer's expectations about what kinds of events can occur in this fictional world. Many bizarre things happen subsequently, but nothing quite this bizarre, and the viewer has no difficulty accepting the bizarre events. The reader of *Alice in Wonderland* soon learns that anything goes. Eggs and playing cards can talk, creatures can grow larger and smaller and can appear and disappear instantaneously. Probably the only way to read it is to view every rule in one's beliefs as subject to exception and treat every seemingly contradictory event as an exception. Another way of saying this: we ignore every real fact that proves inconvenient. Kafka's "Metamorphosis" forces the reader to carve a curiously shaped piece out of his knowledge base: A person can turn into an insect, but he retains his full human consciousness. Insects can be as large as people, but they still have trouble turning over when on their backs. And so on. From the initial events we would expect that anything goes, but in fact it doesn't. Much of the power of the story derives from the fact that for the most part the rest of the world remains the

same, and how is such a creature to make its way in the world we know.

The functions of fiction are the same as the functions of mutual imaginings. Novels can be likened to experiments.<sup>1</sup> Situations that are more or less possible, but not actual, are set up and in a carefully controlled framework the author and the readers can explore the consequences of these situations.

Orthogonal to questions of fictionality are the central questions concerning narrative: What is narrative? And why, among the various forms of discourse, does narrative have its peculiar power over us? I believe the answers to these questions are related.

First, recall one more feature of our cognitive agents. They are planning mechanisms. They have goals, and they construct and execute plans to achieve these goals by decomposing the goals into subgoals and the subgoals into further subgoals until arriving at sequences or more complex arrangements of executable actions. Each of these decompositions of goals into subgoals derives from the agents' beliefs about what causes or enables what. That is, to achieve a goal  $G_1$ , an agent looks for some state  $G_2$  that will cause  $G_1$  and tries to achieve  $G_2$ . As it works through the actions in its plan, the agent monitors its environment to check on the success of its plan. When the plan fails, the agent modifies the subsequent steps in its plan to achieve its goals in another way and perhaps to repair the damage it has done.

A narrative is a species of discourse in which an entity, usually a person, is viewed as just such a planning mechanism, attempting to achieve some goal, generally in the face of some obstacle, and working out and working through the steps of a changing plan to achieve the goal. Since plans are constructed out of our beliefs of what causes and enables what, narrative presents a purported causal structure of a complex of events. It presents a character, like us a planning mechanism, maneuvering among these causal connections, attempting with or without success to

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<sup>1</sup>This comparison was suggested to me by Jon Barwise (personal communication).

create a satisfactory outcome. This is perhaps the thrust behind that most trivial or most profound statement ever made about narrative, Aristotle's overquoted definition of the complete action required in tragedy as something which has a beginning, a middle, and an end. For Aristotle, what defined beginnings, middles and ends was causal necessity.

The peculiar power of narrative derives precisely from this. A narrative describes a planning mechanism planning its way toward a goal. We are planning mechanisms, continually planning our way toward goals. Thus, narrative presents us with situations and events precisely as we would experience them when we are most engaged with the world.

Much of what is most powerful in literature is a conjunction of the two categories—the fictional narrative. It is an author's invitation to the readers to a mutual imagining, to delight and instruct, by the creation of a possible world and possible characters striving toward goals, told in a way that directly reflects our own experience as we plan our way toward our goals in a world that denies us so much of what we desire.



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# LITERATURE AND COGNITION

Jerry R. Hobbs

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