1

Simulation

Imagining Fictional Worlds in Faulkner and Austen

From Deictic Shift to Simulation

Among cognitively oriented literary critics and theorists, one common way of thinking about the imagination of fictional story worlds is in terms of deictic shift.[1] The general idea of deictic shift is straightforward. Most words have a constant referent (individual object to which they refer, in the case of proper nouns) or extension (set of objects to which they refer, in the case of common nouns). Thus *Barack Obama* refers to one person, regardless of whether Barack Obama says it or Gérard Genette says it. So too *kneecaps* refers to the same set of objects no matter who uses the word. In contrast, some words have different referents depending on the user. If Barack Obama says "I," then he is referring to Barack Obama. But if Genette says "I," he is referring to someone other than Obama. Parallel points hold for "here," "you," "now," and so forth. In fiction, the idea of deictic shift is, superficially, the same. Just as Obama might speak about "here and now" referring to Washington, D.C., in 2012, so too he might shift and refer to Dublin in June 1904 if he is reading *Ulysses*.

There are at least two problems with this view of fiction, however. The first is that it is not clear what, if anything, it would explain, if true. Suppose one's writing or reading fiction involves a deictic shift to the story world. Does that tell us anything about the creation or experience of fiction?

Second, we do not literally engage in a deictic shift to fiction, because we are never actually in the fictional world. Of course, a reader might be fully engaged by the fictional world, so entranced as to in effect fleetingly believe that he or she is in that world.[2] But, in fact, he or she is always in the real world. If Obama begins to read *Ulysses* in Washington in 2012, his "here and now" are still Washington in 2012, not Dublin in 1904. By way of contrast, we might think of David Lewis's possible worlds ontology. Lewis was faced with the problem of what defined the reality of a world. He maintained that

reality is indexical – roughly, deictic. The real world is whatever world is the here-and-now world of the speaker. Thus from the world of Obama, the world of *Ulysses* is a possible, but nonactual world. In contrast, for a character in *Ulysses* – say, Leopold Bloom – the world of Obama is a mere nonactual, possible world. (Again, this is according to Lewis's account.) When one reads *Ulysses* in the library, one is, then, encountering a nonactual, possible world. If one deictically shifted to that world, then (in the Lewis account) the world of that library, the world where *Ulysses* is a book, and so on, would simply fade to insubstantiality, a mere wispy possibility.

Of course, one might take deictic shift to mean merely that we interpret a character's "here" as referring to the world of the character, not our world. In other words, we do the same thing that we do when reading a letter (i.e., we take the letter writer's "here" to refer to where he or she was when writing). Indeed, we do the same thing that we do when we understand someone who says, "Come here," and we take him or her to be asking us to come where they are. This is entirely true.[3] But it only restates the problem of what it means for there to be a fictional "here." In other words, it returns us to the problem of what it would explain and how such an explanation would operate.

None of this is to say that deictic shift theory lacks value. In fact, it has considerable value in, for example, isolating types of deixis (see Jeffries and McIntyre 157 and citations). These may guide our attentional orientation in reading texts. In consequence, they may lead us to expand and add nuance to our interpretations. The same point holds for text world theory, with which deictic shift theory is often conjoined. The difficulty is that, even when these two theories are integrated, it is not clear what they tell us as theories (as opposed to how they may guide us heuristically). Jeffries and McIntyre concisely formulate what is at stake: "Conceiving of a text world involves taking up a cognitive position within it. Deictic shift theory specifies how we do this" (161). Again, however, neither point seems true. We do not seem to take up a specifically deictic cognitive position within the "text world." Moreover, if we did, deictic shift theory does not say how we do such a thing; it merely states again that we do it. Indeed, even the precise nature of a text world is not fully clear. As Jeffries and McIntyre note, deictic shift theory "suggests that readers are able to feel involved in a narrative by experiencing vicariously events from a viewpoint other than their own" (158). But that is not an explanation. It is, rather, a statement of what needs to be explained.

A more promising approach to fictional story worlds has been proposed by Keith Oatley. Oatley argues that fiction is a form of simulation ("Why" 101).[4] We know that human minds do engage in simulation. Indeed, we know that people engage in simulation in understanding certain aspects of language

(see Matlock). Moreover, there is a long tradition of connecting something like simulation with literary creation and response. Specifically, simulation is closely related to what literary writers refer to as "imagination."[5] Of course, this relation points to a potential problem with the idea of simulation – it is somewhat vague. In consequence, it is difficult to say just how effective it is as an explanatory concept. Clearly, it is important to flesh out the concept of simulation, to define its properties and principles, before we can use it to account for literary production or reception. Before trying to articulate its properties in a rigorous, theoretical manner, however, we should get some intuitive understanding of simulation and why it is appealing in a cognitive context.

One basic principle of cognitive science of literature and the arts is that the human brain operates using the same structures and processes regardless of whether it is addressing literature or life. Of course, it is in principle possible that there is a special set of cognitive and affective structures and processes that apply only to literature (just as there may be neurocognitive elements that are specialized for language). But the default presumption – in keeping with basic principles of simplicity in theory formation – is that the neurocognitive architecture is constant. It seems clear that, however we operationalize the concept (i.e., however we fix it relative to observable phenomena), simulation is something that we do in ordinary life. Perhaps we currently lack a fully adequate explanation, or even a fully adequate description, of simulation. Nonetheless, it is valuable to identify the literary process of imagination with the quotidian process of simulation. This is valuable because it follows the general cognitive scientific principle of understanding specialized, literary operations as cases of broader, quotidian operations. More simply put, we now have only one process to describe and explain (simulation), not two (simulation and literary imagination).

More exactly, in ordinary life, we are continually engaging in rich conjectures about future possibilities. For example, suppose Smith is asked by a publisher to suggest people who might endorse a book. She thinks of various people in the field and then tries to envision how they would react to the book and how they would react to being approached by an editor about endorsing the book. This involves fairly concrete imaginations. For example, she might think that a particular person would find the request odd. In consequence, she may recommend a way of framing the request that fosters a more favorable response. Of course, all simulations are not that complicated. Suppose it is early spring and Jones is going out on a boat. When getting ready to go, he imagines what the weather might be like – that is, he simulates the experience. This simulation leads him to recognize that it may be windy or sunny or both. As a result, he brings a jacket and a hat with a brim.

It seems very likely that this is the same sort of process that occurs in the creation and (in a more limited way) the reception of literary works. As Suzanne Keen notes, citing empirical research, literary authors often view themselves as describing what characters do autonomously (126–127).[6] This seems to be a prime case of simulation, precisely the sort of thing Smith was doing in envisioning how various scholars might respond when approached about endorsing a book. Of course, there are differences as well, but the differences seem to be a matter of detail, vividness, and potential emotional engagement for an audience. The differences do not seem to be a matter of basic principles.

For example, suppose Smith is thinking about trying to cross a river with a wagon – or, to use a more current example, a station wagon. She is likely to envision the possibility that the car will be flooded, turned over, struck by unseen debris, and so on. This is precisely what William Faulkner envisioned in describing the Bundrens' attempt to cross the river in *As I Lay Dying*. In Faulkner's case, the simulation was far more detailed, far more explicit and elaborately developed. If Smith imagines the wagon being overturned, that may be enough to produce an aversive emotional response that will prevent her from trying to pass through the river. In that case, there is no reason for her to dwell on the details and to elaborate on the various contingencies. Faulkner's purpose was to produce an effective story for readers who are not considering whether to cross a river, but who are reading a novel. This is, of course, a difference. However, it is a difference in purpose or motivation, not in the fundamental cognitive processes involved. That identity of processes is, again, the first reason why the idea of fiction as simulation is valuable – it reduces what we have to explain.

Indeed, the parallel goes beyond the sort of causal development just suggested. In describing Smith's decision about the wagon, we noted that she may have an aversive response to the simulation. Alternatively, she may more fully envision a successful passage across the river, with consequent feelings of relief and pride, fostering an inclination to continue forward. In either case, the key point is that the simulation operates emotionally. It is, of course, not only emotional. There are necessarily inferential elements. However, in everyday life, our simulation of possible outcomes is crucially bound up with emotional effects. Simulation has consequences because it engages motivational systems.

Consider again the example of book endorsements. When Smith thinks about the press approaching some important cognitive scientist for an endorsement, she might imagine the scientist responding with irritation at the presumptuousness of the request. This produces an aversive feeling of shame ("How could I be so presumptuous as to ask such a renowned figure?").

At the same time, Smith is likely to imagine the pride she would feel from this person's endorsement of the book. These produce contradictory motivational tendencies. Smith may then try to reconcile the contradictory feelings by formulating a way of framing the request that would be less likely to produce a shame-provoking refusal. We might say that Smith's imagination produces an emotional profile for the complex of possible outcomes. That profile may be more or less strongly aversive or attractive for particular choices. Initially Smith may feel very shy of the distinguished scientist. With a more cautiously worded request for an endorsement and thus a revised imagination of the situation, however, the emotional profile is likely to change. As a result, she may be inclined to carry through with the request rather than refraining from it. In other words, the profile may become more positive toward that action, although it is still ambivalent.

Much the same point holds for the simulations involved in literary creation. These too are designed to produce emotional profiles, with varying degrees of ambivalence related to preferred and dispreferred outcomes.[7] These profiles may have consequences for real-world behavior, most obviously in the case of didactic works that encourage particular ethical or political choices and actions. Nonetheless, in literary works, the emotional engagement of the simulation is commonly an end in itself (even if it is not the only end or goal of the work). Again, this is a difference. But it is a difference within a more encompassing continuity, as both quotidian and literary simulation operate centrally to produce emotional responses in the context of multiple possibilities and preferred outcomes.

It is worth noting that this stress on simulation has some significant theoretical implications. For example, much of the discussion of verbal art has concerned the differences between fiction and nonfiction.[8] The present analysis suggests that, in a cognitive account, the most crucial issue may not be whether a particular narrative is claimed to be true. Rather, the most crucial issue may be the degree to which a given narrative involves simulation that goes beyond experience and logical inference. In other words, the most important opposition may not be fiction/fact, but simulation/report – although, of course, a fictional work will allow greater scope for simulation than a work more or less constrained by claims of truth.

Although the following discussions will not stress the point, it is important to note also that simulation is not confined to the author. Typically, the author chooses to represent one simulation and elaborates on it extensively. The reader, however, must continually engage in the more ordinary, limited simulation of other possible outcomes. In elaborating on the Bundrens' river crossing, Faulkner largely confines his account to what "really happened"

in the story world. But the reader must continually be aware – thus must to some degree simulate – other possibilities. For example, the reader must understand that Cash could die when the wagon is overturned. That understanding is consequential for reader response primarily insofar as the reader to some degree simulates Cash's death. That simulation, however limited in time and detail, is what allows the reader to feel relief on discovering that Cash is alive. Indeed, the reader's simulation is presupposed by the author's simulation, for the author incorporates a receptive simulation in anticipating the emotional effect of the work. For example, Faulkner's simulation almost certainly assumed the reader's imagination of Cash's death and relief on learning that Cash is alive.

The Function-Approximating Mechanisms of Simulation

The importance of emotional response simulation is bound up with evolutionary development. Specifically, it seems clear that our capacity for simulation is adaptive.[9] That does not mean that it is perfect. Natural selection operates on mechanisms that approximate functions, not on functions as such. In other words, genetic traits result in certain bodily processes. When there are different traits in a population, one such process may be more likely to lead to reproduction than another. The process is the mechanism; the reasons for the advantage in reproduction constitute the function. For example, certain sorts of perceptual and amygdala-based sensitivity may predispose some people to fear slithering things. That process of fear includes an enhanced inclination to notice, avoid, and escape from slithering things. Since snakes are often deadly, this process should, on the whole, mean that the people with the initial sensitivity are more likely to flee snakes, thus more likely to live, thus more likely to produce offspring. Therefore the function is, roughly, living by avoiding poisonous bites. It is clear, however, that the mechanism (fear of slithering things) leads us to avoid some things that are not deadly (nonpoisonous snakes). Thus the mechanism and the function are not identical. However, the mechanism approximates the function adequately. In consequence, it will lead to the spread of the genetic tendency in the population.

It seems clear that simulation approximates an adaptive function. The fact that it is itself a mechanism rather than a function explains why our simulations can fail – indeed, often do fail. The crucial point is simply that having the capacity for simulation confers a reproductive advantage that we would not have if we lacked the ability to simulate. In other words, it is not to say our simulative capacities are the best possible ones or that they succeed in every individual case – just that they succeed often enough to be advantageous.

Conversely, for simulation to have functional consequences in evolution, it must operate through mechanisms. These mechanisms are what we find when we delve into the nature of simulation.

The first property required of simulation is that it be accurate more frequently than chance, as chance is presumably what would govern the benefits and harms of our actions if we lacked simulative capacities. This is straightforward. The difficult part is spelling out how this happens. It is well established that in simulation, many of the same areas of the brain are activated as when we interact with the real world. For example, when we imagine seeing a cup, to some extent our brains behave as if we were actually seeing a cup (see Kosslyn 295, 301, and 325). Moreover, our spatial and temporal relations and actional orientations in simulation are closely related to those that occur in reality. Speaking of a reader's simulation, Zwaan points out, "Ongoing events are more active in the reader's mind than past events, physically close objects are more active than more distant objects," and so on (534–535). Decety and Stevens explain that "simulation of movement … activates the same cortical and subcortical structures that mediate motor execution" (14–15). Indeed, when simulating a motion, it becomes more difficult to engage in contrary motions (such as moving one's arm in the opposite direction; see Decety and Stevens 5). This parallelism between actual and hypothetical experience is undoubtedly an important factor in the accuracy of our simulations. The mere fact that our imagination of a cup in certain respects mimics our actual experience of a cup presumably makes it much more likely that the simulation is accurate.

Here, then, two questions arise. One concerns differences between simulation and interaction with the real world – that is, perception or action. The other concerns the precise nature of what is activated.

As to the first question, there are fairly clear functional/evolutionary requirements that bear on the difference between simulation and real perception or action. First, we should not confuse our simulations with real current conditions. If we did, we would not be simulating possible future conditions, but hallucinating real current conditions. Second, related to this, our "action readiness" (as Frijda would call it [see 69–71]) must in some way be dissociated from our responses to the simulated scenarios. As cognitive scientists like to say, our simulations take place "off-line." To speak of dissociation may be slightly misleading as it could suggest that our simulations take place in periods of leisure. That may be true, as in the case of potential book endorsers mentioned earlier in the chapter. However, as Decety and Stevens explain, "Simulation of movement precedes and plans for upcoming physical action" (14). Even in a critical situation, one may simulate different scenarios (e.g., if one is in some dangerous situation while driving). In those cases too one

needs to dissociate action tendencies from simulation, even if only for a moment as one considers the alternatives ("Should I swerve left or is there a car in that lane?").

At the same time, this dissociation cannot result from the absence of motivational arousal. As already noted, emotional engagement is critical for the evolutionary operation of simulation. If simulation proceeded without emotion system activation, then it could not motivate action in one direction rather than another. That would render it inconsequential. The adaptive function of simulation is no less dependent on emotional response than it is on relative accuracy or temporary dissociation from action. If Jones did not find the imagination of being cold aversive, he would not be motivated to bring a jacket on his boating trip. If Smith did not find some ways of approaching the famous cognitive scientist to be embarrassing, she would not engage in the effort to think of other ways that would not be embarrassing.

It should be clear that all the properties we have been considering are found in literature just as they are found in ordinary simulation. Indeed, they occur with increased intensity. Literature develops the defining characteristics of simulation by enhancing the vividness and detail of our imaginations (a point explored by Scarry). It also extends the dissociation of action from simulation, since we are most often unnaturally immobile when reading or watching a movie or play (as Norman Holland stresses in *Literature*). Finally, it elaborates and intensifies our emotional experiences (as many theorists have indicated – for example, the classical Sanskrit aestheticians, such as Abhinavagupta).[10]

But here a further issue arises. We take enjoyment out of watching painful experiences that produce aversive emotions, such as fear and sorrow. This seems to go against the entire operation of our emotion systems. It makes sense that we would enjoy comedies where we experience pleasurable emotions, such as mirth and empathic love. But why do we enjoy tragedy and melodrama?

This problem is in fact much broader than literary cases. The same issues arise in our response to simulation generally. Indeed, it is crucial to the adaptive function of simulation that it not be confined to pleasurable outcomes. If Jones simply stops simulating the discomfort of a windy period on the boat, then he will not bring a jacket. If one avoids simulating potential dangers while driving, then one may engage in risky behavior. Of course, sometimes this happens, but often it does not happen. Often, we do envision aversive outcomes and thus avoid them.

One possible explanation for this phenomenon may be suggested by research on compassion. When we experience compassion for other people,

our reward system is activated (see Kim and colleagues; our reward system is involved in seeking and in pleasure or reward anticipation [see Kupfermann, Kandel, and Iversen 1010]). Our response to our own future selves is in some ways a version of compassion, for we are in a sense empathizing with the emotional responses that we may have at some other time. It is plausible, then, that there is some reward-system activation in all forms of emotionally consequential simulation. Nonetheless, it seems very likely that on the whole, this will be stronger in the case of other people than in the case of ourselves. In other words, in most cases, our reward-system response to other people's suffering will be stronger than any such response to our own simulated suffering – or, more precisely, the reward-system response may be the same, but the countervailing aversive emotions will be stronger with respect to ourselves. (The exceptions here involve strong attachment relations – thus one's spouse, children, parents, and so on.)

Here, of course, we have a difference between literature and much real-world simulation. Certainly, one's real-world simulation involves imagining other people. In the evolutionarily crucial cases, however, it centrally involves simulating oneself as well. This is not the case in fiction – at least not for readers. Thus we would expect the reward-system activations of empathy to be particularly strong in literature (or the aversive emotional response to be less strong than in real life, with its egocentric involvements).

We may summarize many of the preceding points by saying that simulation has adaptive functions only to the degree that it is not the same as fantasy. We may define fantasy as a form of imagining in which one entertains only pleasurable outcomes. This can occur if one simply breaks off the imagination at the point of aversive feeling, as just suggested. But it can also occur if one simply produces happy outcomes. Here we come to another crucial feature of simulation. Our imagination of our own and other people's actions may be guided by our own wishes or by something else. It is crucial that we are able to imagine actions and outcomes consistent with our wishes. These are what yield our preferences. We would never have goals if we did not imagine happiness conditions, feel joy in considering them, and envision ways of pursuing them. However, this remains at the level of fantasy. When we begin to make concrete *plans* – plotting algorithmic sequences of actions that will lead from our current state to the desired state – we need to be able to distinguish between what is possible and what is not possible, what is dangerous and what is not dangerous, and so on.[11] This is the function of simulation, as opposed to fantasy.

In these cases too there are properties that simulation must have if it is to operate adaptively. Specifically, it will do so only if it is not guided simply

by our wishes (even though the final goal state is defined by those wishes). In other words, it has to be guided, in some sense, by the objects or conditions one is considering. This is precisely the sort of thing that we find among authors who say that they are reporting what their characters do autonomously rather than simply making up what their characters do (see Keen 126–127) – or, alternatively, among readers who say that an author has made a mistake in judging what a character would do.[12]

In short, simulation involves a response to imagined scenarios that is directly parallel to our response to comparable real scenarios, sharing emotional engagement or motivation system arousal. However, it dissociates that arousal from actional outcomes. The emotional response is in part a matter of the ordinary emotions (e.g., fear in the face of danger). However, it is also affected by the engagement of reward systems, which produce pleasure in imagining even aversive outcomes, perhaps primarily through compassion. This is not to say that all imaginations are the same in terms of pleasure and aversion. Fantasy involves imagining solely pleasurable outcomes and is crucial for defining goals and motivating goal pursuit. In contrast, simulation is constrained by real-world principles, such as the propensities and inclinations of other agents. Such constrained imagination of how people will act or conditions will develop is, of course, imperfect. However, it is accurate enough to make simulation more reliable than chance (thus far more reliable than fantasy) and therefore adaptive.

Levels, Means, Processes, and Topics of Simulation

We may now turn to the second question introduced at the beginning of the previous section, the question about what is activated in simulation. To consider this issue more clearly, it is useful to consider some simple cases of simulation. Suppose Doe imagines having a coffee in a coffeehouse. This may be a quick, spontaneous imagination, the purpose of which is simply to determine if she wants a ceramic or paper cup. If she simulates those choices, then she has certain standard versions of a cup in mind. Thus she is guided by a prototype. Alternatively, the imagination of ceramic and paper cups could be embedded in a larger simulation of going to a coffee shop. Doe envisions entering and walking toward the counter, placing herself in line behind anyone else who is waiting, telling the waitperson what she wants, paying, and waiting to take the coffee away. In this way, Doe's simulation is guided by a script or standard set of actions and expectations in specific social circumstances (here, a coffee shop). (For a fuller discussion of prototypes, see Rosch and citations; on scripts, see Schank and citations.)