[slide 1] My title Memory: Going Back to Go Forward, presents a cognitive hypothesis: what we call memory is part of a brain process evolved to enhance survival by allowing prediction. Our brains go back to past experience in order to go forward. My literary hypothesis is that this going back to go forward also empowers the complex works of imagination we most enjoy, that our most valued works are scaled up versions of those same basic processes that are needed for the survival of individuals and of cooperative groups.

Slide 2 The relevant cognitive evolutionary assertion is this: human survival and flourishing depend on being able to predict both the immediate future and the long term: shall I run from that animal running toward me? will Vancouver fall into a rising sea? In order to predict, we recognize or construct patterns of causality out of pieces of past experience. According to prevailing opinion in cognitive science, this is why we have memories at all: to make predictions about what might be about to happen and how we’ll react. Memories are the grab-bag of sensory and emotional images out of which we construct a pattern as a guide to the present. Ideally, we use what’s needed, and ignore what isn’t. Not all memories are equally useful. [Slide 3], “Nonpredictive information is useless to the organism” (Bialek, Nemenman, and Tishby, 2008). Plato’s worry about useless or misleading information, recreated by Dickens’ Mr. Gradgrind in Hard Times, is far from dead. [slide 4] Cognitive scientists Tooby and Cosmides, noticing how much time and effort is invested in reporting the goings-on of imaginary worlds – both fictions and lies, searched, fifteen years ago, for a brain algorithm that could sort fictions from truths. Alas, our brains don’t have an algorithm for self-purification: and we see evidence all around us that fictions—romantic and scientific, political and personal—are indeed sources of “data corruption.” But here’s the interesting [slide] literary theoretic point: not only is the corruption of fictions built into the most basic of our brain processes – and that process is categorization, as the cognitive scientists themselves teach us, but it’s a lucky thing it is, because we need the flexibility their hypotheticals afford.
Categorization, abstraction, generalization is arguably the most basic of the brain processes. There is no incoming information in any modality from sun light to song lyrics that isn’t categorized. All animals categorize, and probably plants do too. We need to categorize or abstract because perceptual experience – from whatever source – is rarely going to appear in exactly the same way twice – remembering all stimuli would overwhelm our brain capacity, and serve no purpose. What we have evolved is a way of grouping and labeling incoming information so that similar inputs can be treated similarly. Our fundamental way of dealing with the world is to treat two things that are not actually the same as if they were. Right from the start, then, we can see how absolutely basic fictions are to our brains: The developmental psychologists Mervis and Rosch [slide 5] formalized this usefully: “A category exists whenever two or more distinguishable objects or events are treated equivalently.”(1981)

We do this by ignoring distinctions that seem, at the moment, not to matter. We don’t need most of the details – the images in sound, sight, and touch – supplied by our surroundings. Note, then, that forgetting [slide] is part of the process: forgetting differences allows an abstraction to emerge. We substitute a type word for a set of tokens, as when we collect many kinds of dogs, cats, fish, and birds under the abstract noun: pets. The reduction produces prototypes, and these are often good enough for business as usual. Thus our most basic mental process works by treating distinct items as if they were the same. We easily relate, that is, categorize, (say) a dinner party in a novel or a movie with our own dinners, and with dinners we’ve heard about from others. The act of comparing, recognizing similarities and differences, produces the connectivity, or the pattern, against which similar events in the future will be recognized. The fictional contributions – imagined dinners described by Virginia Woolf or filmed by Woody Allen are shoveled into the brain along with “real” memories, since after all, they are real memories, there is plenty about them that is real. A token from any source may be joined to an already in place type. The claim here is that the reductions, metaphors, or fudges that allow and produce categorizations are inescapably part of our thinking process; their inaccuracies are worth the efficiency they provide. We are not limited to learning only from our own enacted experience.

Part of being able to categorize, then, is knowing how to toggle between a token at hand, and the abstraction that we assign it to – generalization or category, the
type. [slide 7] It is enormously helpful to think of images – a picture, a sound, a taste, a smell, or a touch – all memories, fainter or clearer – as being in a dynamic relationship with abstraction. An image can evoke an emotion or a generalized concept, and an abstract concept can evoke an image or a set of them.

Our brains toggle easily, between types and tokens; the switch, however, is never a one-to-one, get-it-right process. You can imagine a scenario in which a car is just a means of transport, and another in which it is a status symbol, and another in which it is a dangerous weapon. Toggles can be, but are not necessarily shared, and certainly not, determined, even for the same person. Even in conventionalized situations there are many choices, which is all to the good, because we can use different categorizations in different situations. A diamond ring that predicted a happy married life, is a valuable inheritance, 80 years later.

There is now experimental evidence that the toggles that evoke these possibilities are embodied in feedback and feed-forward loops of synaptic connections; the flow is not in one direction. [slide 8] There is no starting point, and that means that incoming information is pre-selected based on circuits of expectations already in place. While type-token relationships are not univocal, one to one, they are constrained by brain structure and by cultural and contextual expectations. In any situation, some interpretations are arrived at more easily than others. [slide 9] “Expectations enable an inner organization that is dynamically self-reconfiguring in ways that respond to tasks, background state, background knowledge, and current environmental affordances.” (Clark, 2013b: 4) These expectations can be precisely demanding: think of the baseball player at bat, gauging whether and how to swing in response to a pitch. Even the best batters get the calculation wrong way more often than not. Getting expectations wrong, in fact, is what literary plots are all about, from King Lear to Elizabeth Bennett. So choices are made, often by habit, but recategorizations can certainly occur, as new, even unexpected information arrives into what Meyer and Damasio (2009) describe as convergence-divergence zones, CDZs. [slide 10], and Dehaene and Changeux call “global workspace.” (1998) [slide 11]

Genre judgments are one of the most important categorization decisions readers of texts and audiences of plays and movies make. We are urged to them by the artists themselves. We may, of course resist authorial intentions, and recategorize by
resorting and rearranging pieces of memory. Haven’t you never been tempted to recategorize a scholarly article as a parody of a scholarly article?

Neurologists Binder and Desai (2011) use the phrase “embodied abstraction” to explain how sensory, motor, and emotional input can coalesce, sometimes to reinforce, but sometimes to disrupt habitual or embedded constructions. Familiar, schematic representations [abstractions, categories,] already in memory are sufficient for an adequate and rapid processing of usual events in familiar contexts. Business as usual may be conducted largely by abstractions – without recourse to memories of sensory or motor stimulation, without involving emotions. Unfamiliar situations, however, can draw in, in fact require, attention to just the kind of sensory and emotional input that creative works provide. In novel contexts..., sensory-motor-affective systems make a greater contribution in fleshing out the representations.

Gaps within the convergence zones will be routinely filled unless something else competes for connection, something powerfully sensory – emotional – that is, bodily world-entangled, and demanding a novel response. Imaginative work of fiction, stage plays, works of plastic art, can be just those disturbing, even enraging, world-entangled events in the lives of their audiences. If they’re present at the right moment, they may be drawn in to fill a gap, or answer a need for a category revision.

So there’s a bifurcation here: lots of daily processing is routine and managed by the sets of tokens that become connected to types, learned within communities, and strengthened by repeated use. And this is not bad: resort to conventionalized toggles saves a lot of energy and increases social cohesion by calibrating understanding and action among members of a group that stand to benefit from cooperating. Popular songs or rituals propagate clusters of emotions, words, and images through a mutually tuned in population. They define the ethos, indeed the ethics, of a community.

But sense experiences tied to strong emotions can pull an individual out of sync with their group and their group’s conventions. Fictions can be used, thus, to nudge change, to suggest recategorizations, new possibilities, to their audiences. Fictions may supply a cluster of images –a set of vivid image/tokens rich in detail in the convergence zones where they can’t be easily toggled to a familiar abstraction, forcing audiences to react creatively. Time’s up, so I conclude by referring you to my forthcoming book, The Contracts of Fiction: Cognition, Culture, Community, due out in March from Oxford, where I describe the way fictional contracts – that is, the
several genres of imaginative work, either confirm the cultural abstractions valued within a community, increasing cooperation and satisfaction, or, just now and then, disturb the existing order, highlighting and preparing its audiences for needed change.

\[\text{Tooby and Cosmides (2001: 9–10.)}\]


