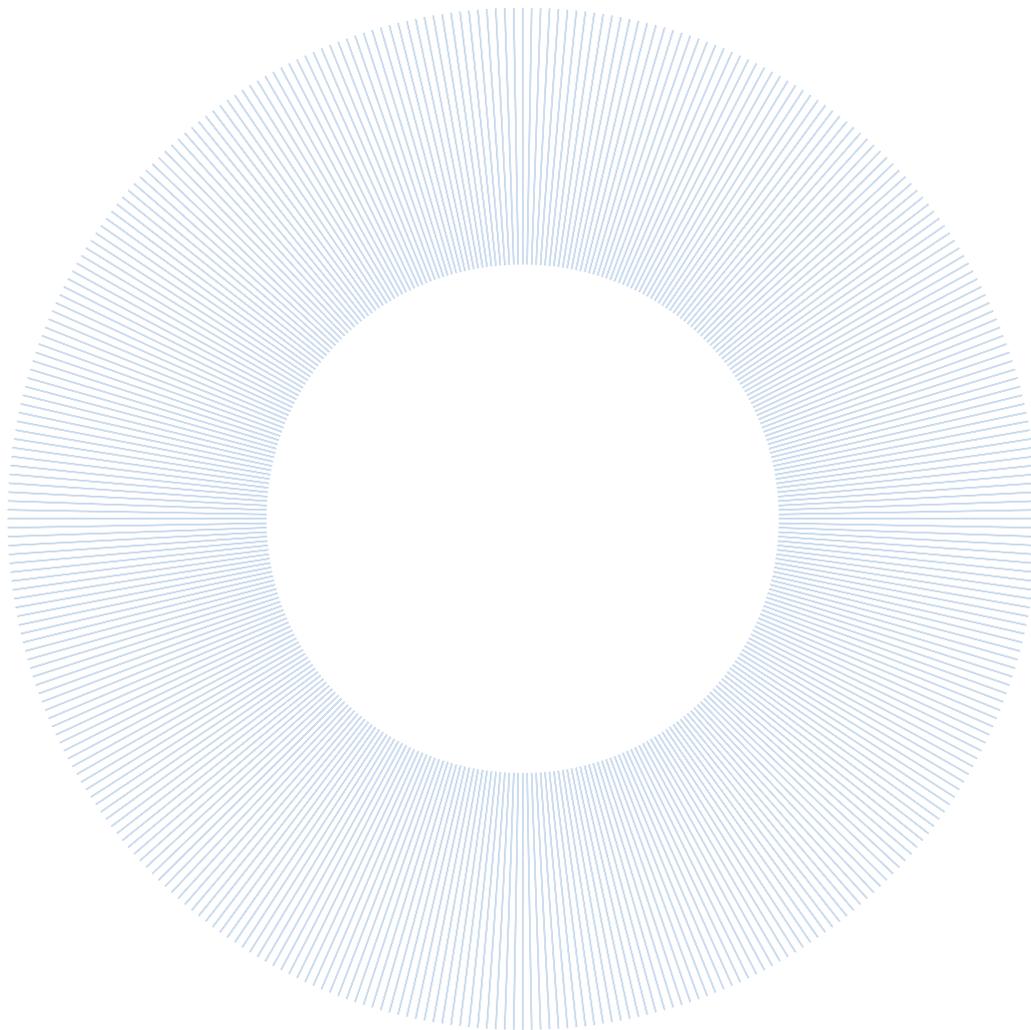


Thinking With Feeling



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THINKING WITH FEELING

How can human beings think effectively about scenarios beyond the ones they actually inhabit? No other species seems to have this capacity for thinking outside the box. To be sure, evolution can create dispositions for the moment that make local thought and action adaptive in the long-term, without the organism's being aware of that adaptation and without the organism's being motivated by those long-range consequences. A human being needs no concept of nutrition or metabolism to feel hunger, needs no dream of grandchildren making great-grandchildren to feel sexual attraction to a member of the opposite sex. But we can also think about scenarios distant in time and space. In doing so, we bring present living and feeling to the service of long-range, big-time conceptions. Here, I explore the mechanism by which human beings accomplish this singular feat.



A self can feel such a singular fixture, hugging one's here-and-now like a twenty-four-hour undergarment, but actually it's a string, looping back and forwards in time to knit together our past and future moments [...]. A self is a Tardis, a time-machine: it can swallow you up and spit you out somewhere else (Ferryhough, 2008, p. 129).

Here and Now

Animals live, think and feel in the here and now. Living, thinking and feeling are biological events, and biological events exist only in the present. When we think about the past or the future, or anything far away, or anything outside the situation we inhabit, the thinking and feeling themselves are not far away – they are right here, right now. They are entirely present, confined to our local, human-scale situation, conducted entirely through the activity of present biological systems.

A human being is an animal. A human being may have been alive 10, 20 or 30 years ago, but our brain activity of 10, 20 or 30 years ago no longer exists. It had its fleeting moment. The only systems for living, thinking and feeling that human beings possess are those run by their bodies here and now.

The inescapable picture with which we must come to terms is the one that Sir Charles Sherrington famously expressed long ago. Sherrington referred to the brain and the central nervous system as an 'enchanted loom' where 'millions of flashing shuttles weave a dissolving pattern, always a meaningful pattern, though never an abiding one' (Sherrington, [1941] 1964, p. 178).



Sir Charles Scott Sherrington, English neurophysiologist. Born 27 November 1857, died 4 March 1952, Eastbourne, Sussex.

From evolution's point of view, it presents no concern that we overlook the central biological fact of our human condition – namely, the fact that it is all here and now. It is probably fortunate that we overlook it. Blindness can conduce to success. From evolution's point of view, there is very little payoff to be had from scientific accuracy on this topic. Evolution's ambition, figuratively speaking, is to lead us to behave in ways that are fit, adaptive. For that goal, what we need is not scientific accuracy but rather conceptions and stories of ourselves that lead to fit behavior. Evolution has given us brains that, on average, pretty much dispose us to such effective conceptions.

But scientific truth lies far beyond the tenacious everyday folk notions that keep us going, that govern our lives. What we want to know is: what is a human being, really, in space and time? The answers are elusive, obscured by our adaptive delusions. Evolution does not particularly want us to look past our folk notions, and this makes the cognitive scientist perverse in trying to trick mental equipment we possess for some purposes to do work for quite different purposes, work the brain is pretty strongly disposed against doing. The question we are trying to sneak up on – what is a human being? – is perhaps the major open scientific question of our age. To answer it, we must focus on the present-ness of our nature.

But what about memory? Does memory not solve the problem of continuity over time? Does memory not bring the past into the present?

It may seem so, but that is merely a conceptual shortcut, an abbreviation, a mirage, a metaphor, a restatement of our present folk notion and gut feeling about the matter, a reassuring picture of what a human being is. Grabbing a folk notion as if it qualifies as a hypothesis and then testing it merely enlists blindness in the service of delusion, wasting time and money. The notion that memory brings the past into the present is one of those useful but inaccurate conceptions we have. In fact, memory is only in the present, and a particular memory is only in the present, even though it seems as if the detailed memory has come winging in from long ago, carried on winds of the past into our present minds.

Both our memory as a system and any particular memory we experience are biological events, biological activities, part of the dissolving pattern. The universe does not bend back upon

itself when we remember, to make two different times intersect in one time. This sense of the intersection of past and present – one of the basic mainstays of life and art, from Homer to Proust, from the witches in *Macbeth* to Doctor Who, is an adaptive delusion. No window is opened from the present onto the past. We do not look upon the past, ever. It only feels that way. Embracing the feeling that we look upon the past may be fine for evolution's interests, but it is folly for science.

Human Scale, Ape Scale, Mammal Scale

'Present' is a loose word, not quite suitable for forming questions about who we are and how we think and feel. I will talk instead about our *human-scale* existence, and what it involves.

Human-scale existence is fundamental for our thinking and feeling. A human being in the local, present moment has, like any mammal, a brain in a certain state of activation, with integrated systems for affect, perception, inference, and construal. Human brains are built to conceive of scenes that are at human scale. At human scale, the following apply.

- We operate within limited ranges of space and time. Before the invention of long-range technologies, what we could influence or engage lay within these limited ranges. Mostly, what we could engage was geographically quite local, and temporally quite close. Accordingly, evolutionarily, our systems of feeling are designed to operate at this scale.
- We partition our sensory fields into objects and events.
- We interact with human-scale objects in human-scale ways: we detect, acquire, and manipulate them, often as instruments for action.
- We recognize some of those objects as agents, with goal-directed behavior.
- We interact with a few agents in patterned activity. We eat, we move, we fight, we mate, we procreate.

That is pretty much what we are built for. In one sense, it is what we are. And for other species, this scale, or a very similar one, seems to be pretty much the entire story of existence.

Of course, it is hard to know for sure about other species, because it is hard to read the mind of a non-human animal. Indeed, it is notoriously difficult to read the mind of *any* animal, human or non-human. All of our cognitive scientific methods – linguistic analysis, measurement of task performance, controlled experiments on human subjects, ecologically valid gathering of data, computer simulation and modeling, lesion studies, brain imaging – are indirect, requiring plausible inferences warranted by rich theory. All of our cognitive scientific methods have varieties of blindness. Our best methodological hope lies in using multiple methods to see whether their indications align in pointing to the same conclusion.

But we are in some ways in much worse shape methodologically when we consider non-human animals, for in dealing with non-human animals, we are deprived of many of our best methods. We cannot interview them, prompt for linguistic performance, analyze linguistic behavior (obviously, because they do not have human linguistic abilities and have even limited communicative abilities), explain anything but rudimentary tasks to them (or any tasks at all), observe their behavior in rich, ecologically valid scenarios of the sort for which they are adapted, and so on. It is hard to know what is going on in the non-human mammalian mind at all. Indeed, the difficulties of inquiring into the capacities of members of other species have led to strong efforts and some rapidly changing views over the last decade, as in the alert from Tomasello, Call and Hare of a few years ago: 'New data suggest that relatively drastic revisions

are needed in our theoretical accounts of what other animal species understand about the psychological states of others' (2003, p. 153).

Of course, we all marvel at our pets (and at nature in general), and it is clear that border collies, tursiops truncatus, bower birds, corvids, pan troglodytes, mice and other species are really impressive, totally awesome. Nonetheless, plainly, there is little evidence that members of other species can go much beyond the scale for which their species has evolved. Think of cat scale, dog scale, rabbit scale, chimpanzee scale, dolphin scale, bonobo scale. There is no evidence that these animals can do much better than struggle at the limits of their scale. For some categories of mental achievement, there is compelling evidence that non-human animals do not get beyond the scale for their species. No non-human animal, for example, seems to be able to understand that other animals hold beliefs, or what those beliefs might be.

It appears that there is a general mammalian line – mammal scale – of parsing *local* perception into objects and events, with the understanding of some of those objects as animate, and a general ape line – ape scale – of parsing *local* perception so as to understand some of those animate others as having direction to a goal. But this does not mean that any of the members of other species has

- a conception of self as possessed of a characteristic personal identity *running through time*;
- conceptions of other agents as similarly possessed of *characteristic* personal identities *running through time*;
- conceptions of other agents as possessed over time with the standard system of elements in folk psychology, that is, emotions, goals, and beliefs that drive actions and reactions;
- a conception of self that includes relationships with the psychology of others, and, conversely, conceptions of those others as themselves possessed of conceptions of self that contain relationships with the psychology of oneself, that is, the self doing the original considering of those others;
- a conception of self and one's personal identity as richly inhabiting both the past and the future.

It is a spectacular scientific puzzle that human beings are the sole species that seems to be able to think and feel beyond the limits of the scale for their species. Human scale is fundamental for human thinking and feeling, but we go beyond it in ways so thoroughly different from members of other species as to place us in a different galaxy of thinking and feeling. We are like Doctor Who, the time lord of science fiction, who can use his Tardis to move across ranges of both time and space that go way beyond human scale. Human beings have a mental Tardis, an internal Tardis. Our mental Tardis is the subject here.

Going Beyond Human Scale

How do human beings think and feel beyond human scale? In particular, how are we able to feel at *human scale* about things that are *beyond human scale*? That is a great trick.

It is important to distinguish this question from another one, and to hold this distinction in mind. Those two distinct questions are:

1. How can we feel at human scale about things that are beyond human scale?
2. How can human-scale thinking and feeling be involved in long-range causal patterns?

Since Darwin, there is in principle little problem in answering the second question. The local thinking and feeling of any mammal can be involved in long-range causality without the mammal's being aware of it, and the same holds for us, and for this reason: evolution builds us so that our human-scale thinking and feelings work in long-range causal patterns without our needing to be aware of that work. We do not need to know about the long-range causality, or have any feelings about it, in order for the connection between our feelings and the long-range causality to work out just fine. Mammals do not need to have feelings about being eaten in order to run from a predator. Long-range patterns of causality for mammals are served if the mammals have local, mammal-scale feelings about what they encounter. No mental Tardis is needed, or perhaps even useful. Appetite, attraction, disgust and fear work in the present with long-range dependencies that mammals do not need to consider.

On these scores, we are quite like all mammals. We do not need to have feelings about long-range causality in order for our human scale feelings to be consequential for long-range causality. For all of human descent, during periods when human beings seem to have had only the slightest conceptions of long-range dependencies, and often quite mistaken conceptions of long-range dependencies, our human-scale feelings carried us along just fine. Evolution took care of that system. No question.

But how can we have feelings about the past or the future that lie outside of human scale, or about spatial locations that lie outside of human scale?

A Conception of a Self

Before we can ask how a human being can have feelings at human scale about things that lie beyond human scale, we need to ask how a human being can have a conception of self that goes beyond human scale. It may seem as if we are regressing here, to prior questions, but that is what cognitive science must always do, because mostly our conceptions about being human are flawed, simple, reassuring cartoons that keep us going but do not stand up to scientific scrutiny. It is easy to think that we know what the questions are and what the conflicting possible alternative answers are about being human, and that our job is to fire up our experimental machines to determine which of these inanities is correct. But these folk-theoretic questions and answers carry the most suspect conceptions of all.

A human being, at human scale, works in a limited scene of human-scale distances of space and time; with limited arrays of other agents, objects and events; with a particular viewpoint, focus and perspective, with local ways of changing them; and with capacities for perception, attention, inference and memory that we possess in the present scene. How do we have a sense of self that goes beyond this human scale?

The Human Mental Tardis: Advanced Blending, Compression and Identity

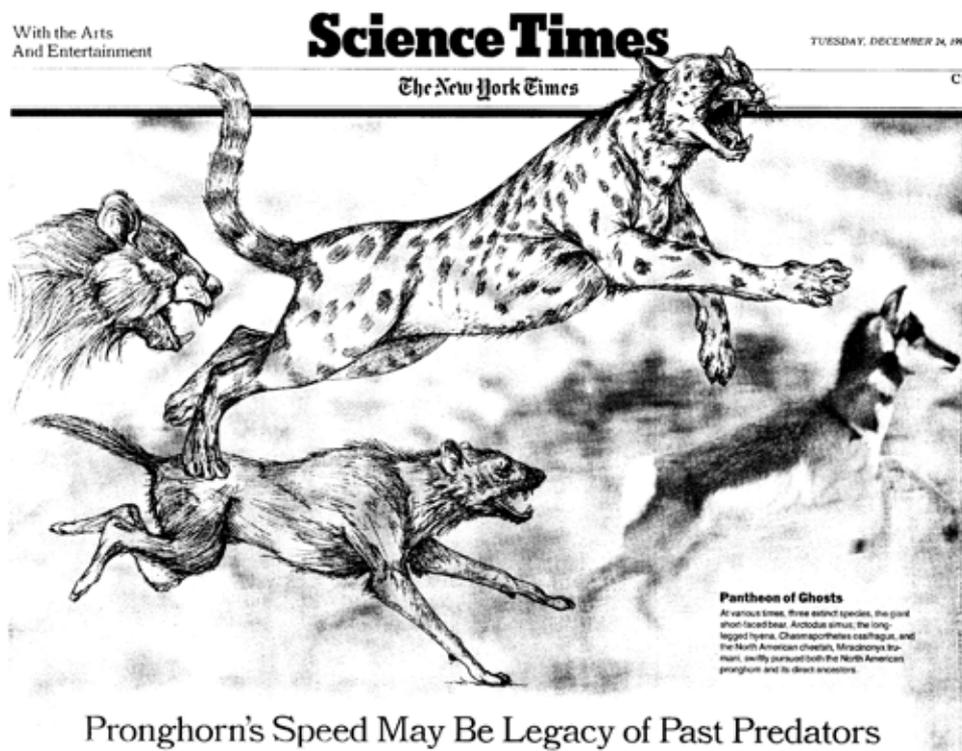
In *The Way We Think*, Gilles Fauconnier and I propose that human beings have a special ability, a defining ability, one so basic to us and so immediate that we usually do not notice it. It is called 'double-scope blending' (Turner, 1996, 2001, 2003–9; Fauconnier and Turner, 1998, 2002). Because of double-scope blending, we do much more than we are built to do. Because of double-scope blending, we are much more than we might have been. Double-

scope blending expands our conceptual world, including our concepts of self and other. It alters the reach of our thinking and feeling.

Blending, otherwise called ‘conceptual integration,’ is a basic mental operation, and its more rudimentary forms seem to be available to other species. We are on a gradient with those species, but human beings appear to have evolved to a more advanced point along that gradient. As a result, we are the only species that can turn what is not at the scale for our species into something that is. We are the only ones who can turn what does not suit our cognition into something that does suit our cognition. We can transform what is not at human scale into something that is at human scale. We can become quite comfortable with what we are not built for, because we can turn it into something that we are built for. The dog or dolphin cannot turn what is beyond its scale into something it can grasp, but we can, by packing diffuse ranges of information that are not at human scale into useful and congenial human-scale scenes. Through double-scope blending, we pull what is alien to us into our own native sphere, and thereby comprehend, manage and organize it. That which is foreign becomes second nature. Exotic expanses become familiar human-scale terrain.

What is advanced blending?

Here is an example to introduce double-scope blending and the way in which it can bring what is not at human scale into human scale.



The ‘Science Times’ of *The New York Times* for 24 December 1996 investigated the puzzle of the North American pronghorn antelope, which seems to be excessively fast, much faster than it would need to be in order to escape its predators. The article proposes that the pronghorn is able to run so amazingly fast because it is running from the ‘ghosts of predators past.’ The illustration for the article shows a picture of a particular pronghorn running, and, superimposed on the picture, behind it, pen-and-ink drawings of very fast predators: the giant short-faced bear, the long-legged hyena, and the North American cheetah.

There is an array of conceptual structure here that is, all on its own and in itself, far beyond human scale. In that structure, there are very many individual animals of various species, many of them in the pronghorn line of descent. Conceptual links of analogy and disanalogy connect these various individuals. But these conceptual links connect vast numbers of organisms, many different locations and evolutionary timescales. The array is not at human scale. Through an extremely common pattern of compression in conceptual blending, all those pronghorns and all the analogy links between them are blended to create a unique pronghorn in a blend, and all those disanalogy links are compressed during this blending to create change for this unique element in the compressed blend. A simpler but still impressive compressive blending is done for the giant short-faced bear, the long-legged hyena and the North American cheetah.

The result of this network construction is a blended mental space that is very much at human scale: one animal, one pronghorn, running for its life as it is chased by three vicious and powerful predators. We are not deluded: we do not think that a North American pronghorn out on the plains of America right now is actually being chased by a giant short-faced bear, a long-legged hyena and a North American cheetah, and that we are watching it. We do not think that a single pronghorn changed during its individual life so as to acquire remarkable speed. But the blend gives us a compressed, human-scale scene that anchors the non-human-scale conceptual network, and so turns what is not at human scale into something that is at human scale. From this compressed blend as a comprehensible platform, we can manage the diffuse network.

The *adaptation* feature of the species in the network is compressed to *learning* for an individual in the blend. The pronghorn *learned* from its predators. And the development of a capacity and an instinct in the network is compressed to *remembering what you learned* in the blend.

There is no evidence whatsoever that a North American pronghorn antelope, or a member of any non-human species, can perform anything remotely like this pyrotechnic example of conceptual blending and compression. But we can. All of us can, from the earliest stages of development, and it feels absolutely effortless to us, because this kind of conceptual integration is what we are neurobiologically built for.

What is an individual human being?

I give the pronghorn integration network as an example because the human-scale blended space stands out, strikes us, is noticeable, and seems imaginative – however useful.

But nearly all advanced conceptual integration goes completely unnoticed. Its second-by-second fabulous creativity is not in the least remarked, and its compressed blended spaces do not seem imaginative or creative. On the contrary, these compressed, human-scale blended spaces seem inevitable, straightforward, effortless, true.

What is an individual human being? The infant born of the mother is extremely different from the baby who crawls and coos, the toddler with its vocabulary explosion at 18 months of age, the child in elementary school, the adolescent, the young adult, the parent, the grandparent. Across this vast conceptual structure, which is not at human scale, there is an extremely complex array of analogies and disanalogies. They are compressed in the blend into a unique element with change. The analogies are compressed into uniqueness and the disanalogies are compressed into change for that unique element. Culture expends great effort in guiding

us to this useful conception. It invests great linguistic resources in giving us stable proper names, legitimate for referring to all this difference by a single term.

Nonetheless, the effect is spectacular: a vast range of objects and events, diffuse across space and time, far beyond human scale, is compressed into a human-scale blended space, in which there is a unique element – a single human being – now at human scale, and anchoring an elaborate conceptual network. Although members of other species can be conditioned, by pain or pleasure, to reactions that we see as continuous across time, there is no evidence whatsoever that any member of another species muses upon its days as a child, what it has gained and what it has lost, how it has altered, for better and worse, what paths it did not take, nor that it contemplates its future beyond the local scale in which its species is evolved to perform. For a human being, however, this contemplation is unavoidable, because we are by nature advanced conceptual blenders. It takes no effort, it is not cognitively costly, for us to understand Paul when he writes:

When I was a child, I spake as a child, I understood as a child, I thought as a child: but when I became a man, I put away childish things. For now we see through a glass, darkly; but then face to face (1 Corinthians 13:11–12).

Our double-scope blending capacity creates unique identities out of disparate scenarios connected by analogy and disanalogy. Roles, especially roles in frames constituting social ontology, are among those conceptual products produced by compressive blending. While non-human animals appear to recognize differences across individuals that we might label with close evolutionary status such as *offspring*, *conspecific*, *sibling*, *mother*, *alpha male* or *predator*, they do not appear to conceive of conceptual entities such as *The Supreme Court*, *Chief Justice of the United States*, *prophet* or *priest*. Such roles depend upon conceptual integration networks compressing across disparate elements. Nor should we assume that even in the case of close evolutionary roles such as *mother* or *predator*, that the animal conceives of the role mentally with any of the rich complexity extending over time that the human being perceives for the animals themselves, much less for the human beings.

The rich human conception of the self also depends upon such compressions. The baby born of the mother, the 18-month-old learning language, the toddler, the lad in short pants, the adolescent, the young man, the worker, the husband, the father and the old man inhabit quite different conceptual frames, with great disanalogies between them. But the analogical connections across them are also strong. These disparate scenes reside within conceptual integration networks that offer a unique self in the blend, a self that undergoes change. This is not to say that the concept of the self is an abstraction over whatever specific local events take place. On the contrary, the personal identity established in the blend can be exceptionally powerful, residing more generically as a stable character in the generic space above all the specific inputs, so much so that when the individual moves to a radically unfamiliar scene with entirely new conditions and agents, the compressed concept of personal identity can be causal for the specific events. This self is imbued, in virtue of the conceptual integration network, with stable but variable beliefs, goals and personal dispositions. The result of this blending is a full agent. The mental existence of such a full agent derives from double-scope blending and greatly advances narrative cognition.

Culture deploys the tools of advanced conceptual integration to support, maintain and enforce a rich blended conception of an abiding self. Strong rituals may be created to increase the analogical connections over time, such as birthdays, to aid the conceptual connection of this local moment, this particular cycle of time, to all the others lying before and after. The birthday celebration, for example, fits a frame – with friends, cake, presents – creating frame

analogies all along the sequence, allowing only secondary details in the ritual to differ – one more candle on the cake, slightly different presents.

The existence of the blend and its personal identity does not obliterate the rest of the network. On the contrary, the human-scale blend makes it possible for us to manage the diffuse array of conceptual structure in the rest of the network, which otherwise would lie beyond our cognitive powers to grasp, explore and manipulate. The blend may contain a unified personal identity while two of the inputs contain quite different selves, even aggressively opposed selves, with a time relation of many years between them. All of these conceptual structures can be activated in a particular scene, as when a woman, drawing on the blend, feels in one way a strong and continuous personal identity, and yet, looking in the mirror, is sensible of the quite different selves she has been, and what one of them might think of the other. When her face in the mirror resembles a picture of herself from years ago – perhaps because of a hat, flip of the hair, lighting, blouse, or smile – she may conceive the scene as one in which the self from years ago now addresses the self looking in the mirror. She may speak, and her voice may in the little story attach not to the body speaking but to the younger person, saying to the older person, ‘you’ve done all right.’ Or the same voice, with a different inflection, may attach conceptually to the older person, saying, ‘I failed you, didn’t I?’ The woman in this moment is not deluded or insane. On the contrary, her ability to range conceptually over the integration network is a sign of her mature understanding, a sign of the human capacity for advanced narrative cognition.

Thinking With Feeling

The blended self can take selective projections from many different conceptual spaces. The conception of a self in the future does not come with its own systems for affect – those come from the present self. And the conception of a self in the past may come with the (present) memory of feelings in the past, or not – but in either case, the actual feelings come from the present system. Human beings have the special ability to think with feeling about scenarios they do not inhabit because of double-scope integration. They can blend present feeling systems with content that is not drawn from the present scenario, to create a remarkable conceptual entity – a self outside of the local scenario that has feelings about the scenario it is in. The feelings generated for that distant self can have an effect on our decision, assessment, judgment and identity. This conceptual miracle is child’s play for the human being, as the epigraph from Charles Fernyhough so eloquently expresses. But child’s play for the human being, in this case, seems to separate us from all other species.



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Insights

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