The Origin of Selkies

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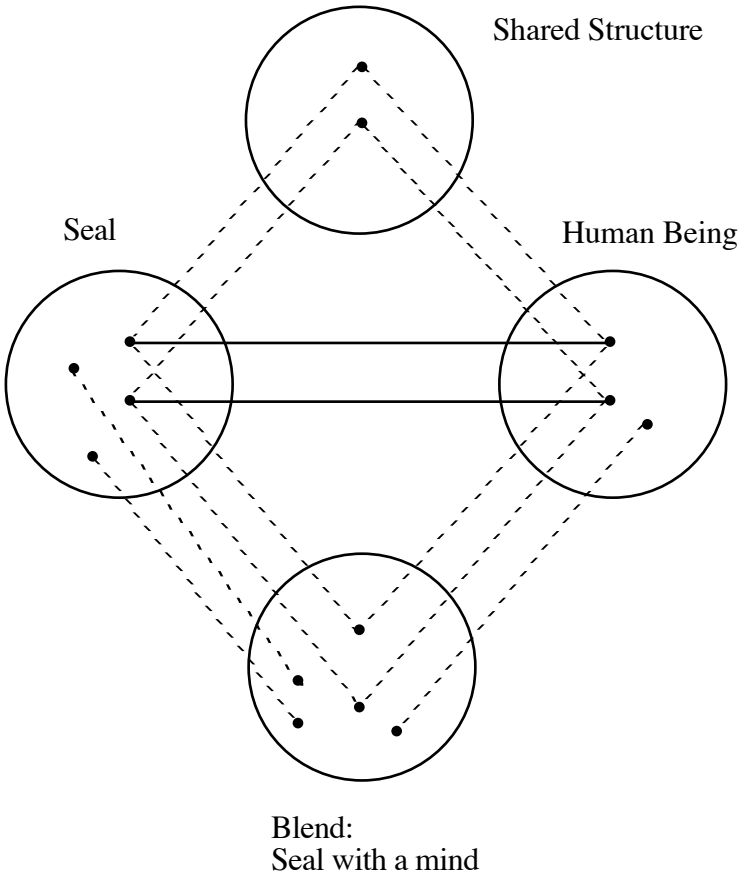
Cognitively modern human beings have language, art, science, religion, refined tool use, advanced music and dance, fashions of dress, and mathematics. Blue jays, border collies, dolphins, and bonobos do not. Only human beings have what we have, and this discontinuity in Life, this perspicuous Grand Difference, presents us with the most abiding and compelling scientific riddle of all.

In *The Way We Think*, Gilles Fauconnier and I put forward the hypothesis that The Grand Difference arose in the following way (Fauconnier and Turner, 2002). The basic mental operation of conceptual integration, also known as "blending," has been present and evolving in various species for a long time, probably since early mammals, and there is no reason to doubt that many mammalian species aside from human beings have the ability to execute rudimentary forms of conceptual integration. Human beings evolved not an entirely different kind of mind, but instead the capacity for the strongest form of conceptual integration, known as "double-scope" blending. Human beings are thus on a gradient with other species, but what a difference an extra step makes. Double-scope blending is the hallmark of cognitively modern human beings, and The Grand Difference is the product of double-scope blending.

What is blending and why is it so important? (Technical introductions to the nature and mechanisms of blending can be found in Fauconnier and Turner, 2002 and 1998; Fauconnier 1997; Turner 2001 and 2003. See also Goguen 1999.) As an illustration, consider our perception of a seal. The eyes of a seal are

remarkably like the eyes of a human being. When we see a seal at the seashore, it is impossible to resist the conclusion that we and the seal share a category. Compelling and evident analogies leap out at us, between the seal's appearance and ours, between the seal's motion and ours. Our human eyes align toward an object as our limbs propel our bodies toward it, and it seems to be no different for the seal.

Working from such analogies, we immediately forge a mental blend of ourselves and the seal. The result is a conception of a seal that has not only all of the seal's appearance and motion but additionally a feature we know only of ourselves—the possession of a mind.



In the mental blend, we conceive of a seal as having a mind something like ours, lying behind its appearance and motion. In the mental blend, the seal's eyes are not merely open, round, clear, and active, but also alert, intelligent, inquisitive, and perceptive. It *inspects* us with wide-eyed, penetrating *attention*. It *intends* to *pursue* an object. It has perception, appetite, and memory. We believe in this blend completely, long before we have any refined scientific evidence for it.

It takes no frisky seal frolicking in the spume to prompt us to conjure in our brains a conceptual blend in which another creature has a mind. On the contrary, this is the sort of blend we assemble unconsciously, from early childhood, for any other human being. In the standard blend that we use for conceiving of another human being, the human being has not only all the organismic appearance and movement that we routinely perceive when we pay attention to the person, but also something we project to it of ourselves—the possession of a mind. It has perception, sensation, and intention behind its appearance and movements, just as we have perception, sensation, and intention behind ours. In the blend, the person whom we watch has mental states that accord with what we see.

We are adept at varying the conceptual structure that we project to the blend. When we perceive that someone is in a situation or condition that is not identical to ours, we can project their situation or condition to the blend, giving their perspective to the blend, with consequences for the thoughts we imagine them to have. When we see that someone's behavior is unlike our own even in identical conditions, we adjust the projection to the blend accordingly. The person we see feels pain, just as we do, it seems, but perhaps he has a slightly higher pain threshold, given that he keeps his hands in the hot dishwater longer than we will. No doubt he has culinary taste, just as we do, and yet, he seems to

prefer spicier food. The seal, too, in the blend, has desires just as we do, but the specifics vary. The seal prefers to eat live fish and mate with seals.

The projection of mind to the seal automatically gives the seal some viewpoint, but we can vary the specific details. We can choose specific details that belong to the conditions of the seal. Alternatively, we can mix in elements that belong to our own condition. At the one extreme, the seal has a viewpoint very different from ours in both location and disposition, and we apprehend the blended seal-with-a-mind from a distance, as a strange and foreign species. At the other extreme, the blend can be given our own first-person viewpoint, and we can see, in the blend, through the seal's eyes. (Try it: in imagination, be the seal looking at you, the human being, watching the seal from the seashore. Do you suddenly feel a little wet? Do you feel yourself trying to keep yourself afloat?) The nature of the mind possessed by the seal in the blend can also be varied: we can imagine what it is like to be a seal with seal-like abilities and preferences, or we can imagine what it is like to be something like us clothed in seal form. Such blending apparently outstrips by a vast distance anything a non-human species can perform.

Children routinely perform such acts of blending in conceiving of other human beings, and perhaps equally routinely in conceiving of animals, with the result that talking animals are the mainstay of the human nursery. Chimps and vervet monkeys show no disposition to make dolls of other species and then attribute to them their own vocalizations, but the creative projection done by the human child can easily produce a seal who talks, who makes friends with us, who invites to come swimming for his birthday party, and who winks at us collusively as we engage in adventures.

These are "double scope" blending networks. A double scope network has inputs with different (and often clashing) organizing frames and an organizing

frame for the blend that includes parts of each of those organizing frames and has emergent structure of its own. In such networks, both organizing frames make central contributions to the blend, and their sharp differences offer the possibility of rich clashes. Far from blocking the construction of the network, such clashes offer challenges to the imagination and the resulting blends can turn out to be highly creative. *The Way We Think* presents the details of double scope blending in examples drawn from mathematics, science, grammar, counterfactual reasoning, causal reasoning, humor, the construction of identity, category extension, artifacts, and so on through all of the categories of The Great Difference.

In all such cases, there is emergent structure in the blend. In the case of the talking seal, the creature in the blend has specific properties that belong to neither the human being nor the seal, that is, to neither of the two mental concepts that feed the blend. Consider the speech of the talking seal. It might have a sound system for its language that includes barks and growls, and a grammar entirely bizarre for a human being. No human being has such speech, and of course no seal has speech at all, but the talking seal has just this emergent style of speech. This is common for talking animals. For example, the animals in Rudyard Kipling's *Jungle Book* have satisfying but emergent speech patterns. The howls of the wolves in *The Jungle Book* are grammatical: one of them, an eerie lupine intonation, "Look well, o wolves!", has an imperative verb adverbially modified and followed by an apostrophe headed by a plural noun!

Three cartoon dogs — Goofy, Pluto, and Scooby-Doo — make it clear that the same set of inputs —*human being* and *dog*— can lead to different blends, because we can vary the projections from the inputs to the blend. Gilles Fauconnier has already pointed out that Goofy gets bizarre humanoid speech while Pluto gets no speech at all, even though Pluto possesses advanced human

communicative abilities and intentionality. A third variant is Scooby-Doo, who has speech that is both grammatically diminished and voiced in a way as to suggest (but in fact dramatically exceed) a canine articulatory apparatus. Donald Duck is the prime example of this phenomenon: no human being has Donald Duck's speech (although a talented human being can produce it), and no duck has speech at all, but Donald Duck's speech is world-famous and seems natural. After all, if a duck could talk, would it not talk this way?

A slightly more remarkable blend of seal and human being creates the concept of a *selkie*. Selkies have new properties. In the folklore of the Orkney Islands, they are shape-shifting beings. When in seal form, a selkie can shed its coat to become a human being, or rather, something deceptively like a human being. When in human form, it can converse and mate with a human being. Selkies shed their coats in the moonlight and dance on the level shore. A prudent selkie hides its coat carefully before cavorting. Here we see a case where the emergent meaning in the blend includes not new properties for a seal but in fact a new species that falls into the category of neither human being nor seal. This is standard for a shape-shifter.

In the selective projection to the blend, the selkie when out of its coat has the anatomical parts and proportions of a human being but the sleek and lithe movements of the seal. Accordingly, when out of their coats, selkies are sexually irresistible to human beings. In the Orkney legends, a man sometimes steals the coat of a female selkie to compel her to agree to marry him if she ever wants to regain her coat.

But male selkies also shed their coats and slip into villages to mate with deliriously grateful women. Selkies have a relation to their coats that is a blend of a seal's relation to its skin and a human being's relation to clothes. Selkies take off their clothes to have fun, and are vulnerable when thus "naked." The range of

emergent properties in this blend is fascinating: for example, in these legends, a child who has one selkie parent might have slightly webbed fingers and toes.

On the one hand, when we recognize that a blend is purely imaginary, we are excused from explaining how it could be possible. Who cares if it is impossible, since it's so much fun? The pleasure of imagining the blend can be warrant enough, as when a child takes pure delight in imagining a talking dog, all the while knowing that real dogs do not talk.

On the other hand, when we reify the blend—which is to say, when we assume either earnestly or in jest that the blend refers to real situations—we often feel, at least tacitly, an obligation to offer some account of how the blend can have that earnest or playful reference. One way to explain the "reality" of the blend—and in human cognition this is by far the path most traveled—is to assume, without analysis, that the emergent properties in the blend in fact belong to the input. For example, when we blend ourselves with another human being to create for that person a mind, we see no problem with the "reality" of the mind in the blend, because we assume, without even thinking about it in the least, that the human being in fact *does* have a mind to begin with, regardless of any imagining on our part. It was always there; we did not create it. We accordingly feel no obligation to account for the "creation" of a mind in the blend because we reject, or in fact never even recognize, that there was any imaginary creation at all. Indeed, we never recognize that we have done any conceptual blending.

Similarly, we feel no need to account for the "creation" of a seal-mind in our usual conception of an everyday seal, because we reject, or more likely do not even recognize, that there was any imaginary creation at all. We do not even see the operation of blending that has provided the concept of a seal with a mind. When we consider these phenomena, we must distinguish two quite different questions. The first is, do we believe that in fact human beings have minds, quite

independently of our recognizing them? The answer is absolutely yes, we most certainly do. We believe that before our birth and after our death, people had minds, and that the reality of these minds depends in no way on us. It is right that we have this belief, as a matter of science, on the basis of evidence of every kind. But the second question is, do we *conceive* of people as having rich minds without creating an imaginary blend in which they are equipped with one by projection from us? The answer here is no. Advanced blending of this sort is just how human beings, I propose, attribute robust minds and rich mental states to other human beings. It is identically how they attribute robust minds and rich mental states to seals, horses, lemurs, and sometimes to trees, balloons, trains, ships, and automobiles. Blending research has as one of its branches the study of how we conceive of other minds.

In the case of the selkie blend, reifying the blend calls for some additional explanation, because we do not in fact believe that all the emergent properties of the blend actually come pure and simple from the original input. That is, we do not believe that seals already have the properties of selkies. We do not say, for example, "oh, selkies can slip out of their coats because seals can." Indeed, we do not even think the seal is a selkie, or that the human being is a selkie: the entire species of selkie is an emergent element. Manifestly, it cannot be found in either input.

There are other ways to account for the "reality," even the in-jest "reality," of the selkie blend, aside from assuming that the reality is already in the inputs. A common way of accounting for the "reality" of the blend is to find a causal transformation that begins from one or both of the inputs and produces the blend as a caused effect. So, for example, the cartoon action-hero Spiderman, a blend of a teenage boy and a spider, came into existence when a spider, transformed by radioactivity, bit the boy, and the radioactive arachnid venom

mysteriously turned him into Spiderman. Spiderman's powers are not actually in either of the inputs — a spider, for example, does not shoot out a web-rope over a vast chasm and then grab the rope to swing like a dangling Tarzan to a perch on the other side — but the radioactive venom mysteriously caused the boy to develop this slick ability. The explanation is only in jest, but it has a rational form.

Similarly, in the children's book *Martha Blah-Blah* (Meddaugh, 1996), Martha, who is a dog, starts out as a great communicator, equipped with exceptional but nonetheless authentic canine abilities. "But when she ate alphabet soup, the letters went up to her brain instead of down to her stomach, and Martha spoke words." (page 4). Naturally, she has canine dispositions. Her first words are, "Isn't it time for my dinner?" She says, "At last! Now I can say: I'm hungry! Let's eat. Make mine Steak! and . . . Let me OUT! Let me IN! Let me Out. Let me in . . . " The in-jest explanation for the in-jest reification is marvelously elaborated in this book. Martha's family gives her a bowl of alphabet soup every day to replenish her linguistic ability. But when the profit-hungry heir of the soup company cuts corners by eliminating some of the categories of letters in the soup, with the unfortunate result that Martha consumes no Bs, Ss, Ts, or As, then Martha is reduced to uttering pitiful gibberish. Of course, since *Martha Blah-Blah* is a tale of self-reliant pluck, Martha sets off to restore what has been lost, and wins in the end.

In the selkie legends, there are three common explanations for the reification of the blend. The first is death. Death, often viewed as a mysterious but powerful and transforming cause, changes things. What happens after we die? Maybe it depends on how you die. In this case, someone who dies by drowning becomes a selkie, and is able intermittently to regain human form. The second explanation is cosmic justice. People who behave badly are turned into

selkies, imprisoned in the body of a seal for the term of their natural lives. The third explanation is by assumption: Selkies are fallen angels who, ejected headlong from heaven, landed in the sea. Their interim punishment is to remain in selkie form until Judgment Day. This account conveniently defers explanation to the antecedent blend of fallen angels. The selkie is accordingly a hyper-blend, of seals and fallen angels. Why are selkies possessed of amazing powers? Because the angels who became selkies had amazing powers. Why are these angels stuck in selkie form? Because fallen angels were punished and confined by the Almighty. Turning the fallen angels into selkies followed poetic justice: when the fallen angel touched the surface of our mortal plane, it was transformed into a terrestrial species, and the type of species was determined by point of contact: fairies on land, selkies at sea.

I will call the conception of a world with selkies in it "Selkie World." Such a half-magic world almost never extends through all the realms of our world. Instead, it usually exists as a liminal component of our world. Special human beings, themselves somewhat liminal, might brush up against these half-magical elements at special places (the seashore, an attic, a castle) at special times (often the past) and when they are in a special state of mind (often childhood). Blood-sucking vampires are out there, in the graveyards and the alleyways and the underpasses. Somewhere, in a moonlit hour, lovely selkies are dancing by the sea. If you look hard enough and with just the right cast of mind, you might find fairies, zombies, werewolves. But, canonically, it isn't so easy for just anyone to encounter these creatures just anywhere, anytime. Of course, there are stories that invert this expectation, so you find yourself waiting in line at an ice cream parlor behind a nondescript leprechaun, or giving change to the vampire who needs it for the parking meter.

It is common in art to work with many blends, and to make blends of blends. A particularly elaborate development of the selkie legend is offered in a well-known modern tale for older children titled "Aunt Charlotte and the NGA Portraits."[1] NGA is the acronym for "National Gallery of Art," the one in Washington, D.C. It sits next to the Capital Building on the National Mall.

"Aunt Charlotte and the NGA Portraits" presents a character named Olga Weathers. Halfway into the story, the reader discovers that Olga is a selkie lacking her coat. The word "selkie" never occurs in the story, and no prior knowledge of selkies is required to understand the story. Indeed, when I first read the story, in middle age, I had never heard of a selkie and assumed that the shape-shifting Olga was entirely the author's invention.

Olga has the mental character of a woman but, understandably, no native taste for the human world. She would prefer a life of swimming in the water. Wearing her coat, she would have something like the body of a seal, naturally. But not quite, since her coat can be removed, and when it is, she becomes a woman. But not quite, since, when she is a woman, she retains her knowledge of the sea and retains, too, the remarkable instinctive capabilities of a marine mammal.

Olga Weathers has features possessed by no seal. Neither seal nor woman can lose its skin or assume the skin of another species. Neither seal nor woman can be transformed into a member of another species. And it is not only Olga who is different in the world of this story. A real man in our world cannot obtain a wife by stealing the skin of a seal, but in the story, a man can try to get a wife by stealing the coat of a female selkie.

These things are possible in Olga's world. She switches from species to species according to whether she is wearing her coat. She is never either woman or seal, but always something different, and this difference counts in the story as

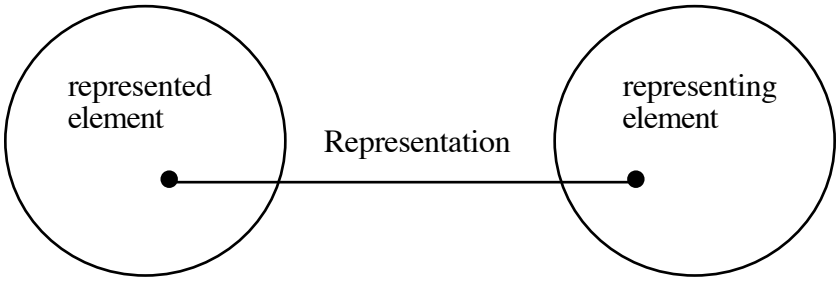
her "magic." A mean man, it turns out, did steal her coat. He hoped she would marry him in order to regain it but she refused to marry him, because she knew he would have kept her coat forever, and she would never have been free. He thought she was helpless and had no choice, but she was not powerless, and she had a few friends who helped her make a home on Ocracoke, a seaside town in North Carolina, where she earned her living by helping the fishermen. Olga can tell where the fish are, and she can foretell the weather, and she has a sense for the conditions of the sea. The fishermen therefore pay her for advice. In Olga's World, it seems, boats have an intentional nature, too, or at least, they can hear a selkie, and they are happy to comply with her requests. She can call the boats home when they are lost.

As luck would have it, the man who stole her coat was injured while hunting narwhals. The wound turned septic and he died without telling her where he had hidden her coat. So there is Olga, beached on Ocracoke.

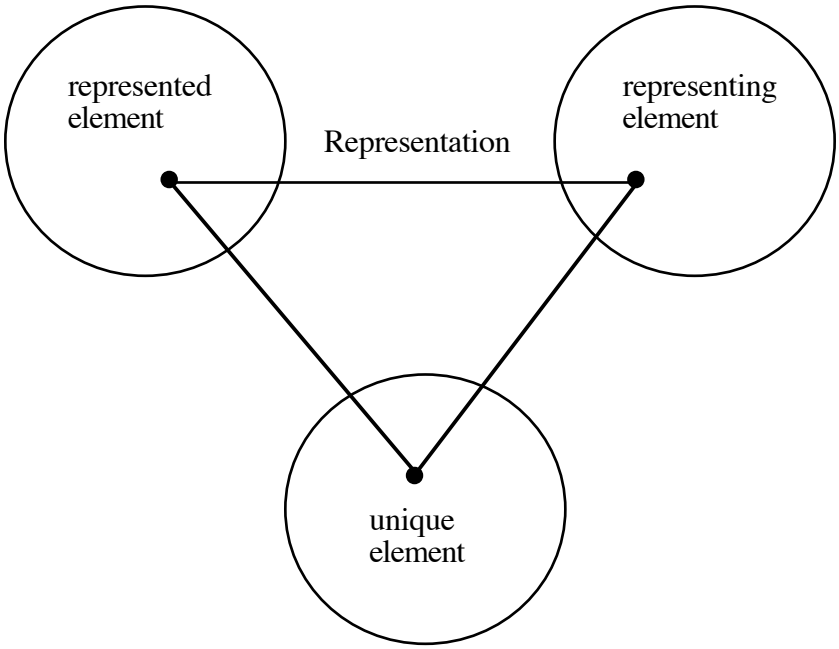
In the blending network that produces this selkie, the shape and movement that are projected from the human being input and from the seal input to Olga do not make her lithe and frisky. On the contrary, her body is massive, like a seal's, and she has relative difficulty moving on land, as a seal might. She is hefty. Her long hair combs out in perfect waves. She is herself a kind of undulation whenever she passes over the sand.

Olga's world, inhabited by selkies, is tinct to that extent with the magic of shape-shifting, the magic of moving from one category to another, of blending incompatible elements such as woman and seal to make not just a mental blend but elements in the world to which the blend refers. There is another magic pattern of blending in Olga's world, and this additional magic is also based on a very familiar pattern of blending, one that concerns our everyday, entirely pedestrian concept of representation. Human beings effortlessly understand the

concept of "representation." As a matter of straightforward practice, we routinely put something and its representation into mental correspondence. The representational element is understood as "representing" a world or a scene or an element in a scene.

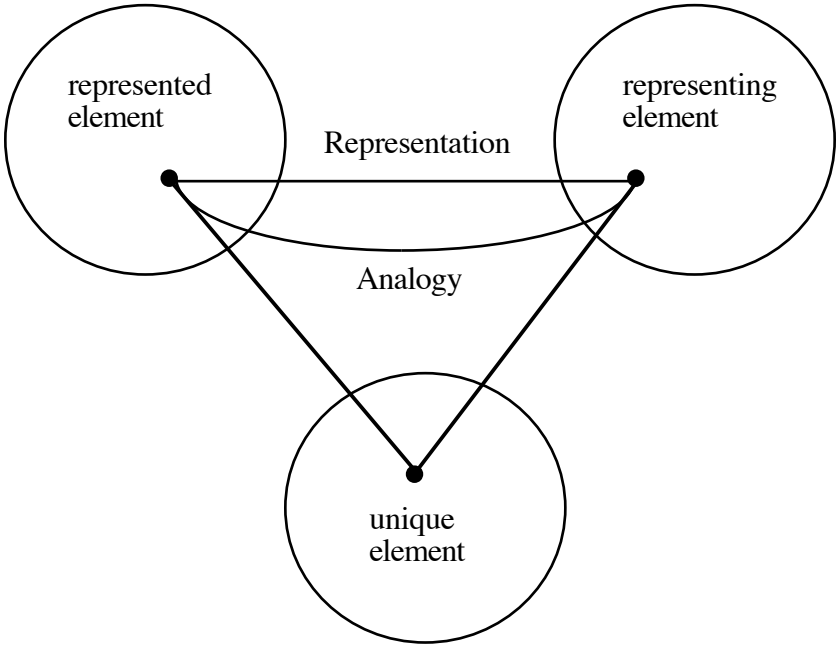


It is extremely common for us to blend these two related spaces and in so doing to compress the "outer-space" relation of *representation* between them into a unique object in the blend:



For example, a person and a photograph are two quite different things, but we can blend the photographic element and the person. In the blend, the

person is fused with the photographic element. We point at the picture and say, "This is John." Of course, we are not deluded in the least: we know that, in the contributing space with the person, John is three-dimensional and moves. We know that the photograph is two-dimensional and does not move. But the conceptual blend in which the representation of John is fused with John is extremely useful. Most blends of this sort, but not all, have outer-space connections not only of representation but also of analogy between the representation and the element represented. That is, the visual image that is the representation of John is visually and topologically analogous to John himself: there are two images of eyes in the representation and two eyes in John's head; the two images of eyes in the representation are above the image of the nose in the representation just as John's actual two eyes are above John's actual nose; and so on.



In addition to the contributing mental space that contains the representation and the other contributing mental space that contains what is

represented, there is yet another contributing mental space that can be brought into this common "compression of representation" network. A window, or a gap in the curtains or the fence, or a portal of any sort gives us a view. When we catch only a punctual view through a portal, we get a framed glimpse. Many vital conceptual relations create a connection between a framed representation and a framed glimpse. For example, a photograph of a person and a framed glimpse of the same person are strongly analogical not only in the content of what is viewed but also in the fact that there is a viewer of that content. It seems to be conventional to blend the photograph of a person with a framed glimpse of the person, so that, in the blend, the representation of the person is the person while the entire representation is a framed glimpse of the part of the visual field the photograph represents, including the person. We often say not only that the photograph gives us a "glimpse" but also that a true visual glimpse is a "snapshot." This blend of representation and framed glimpse is especially irresistible in the case of cameras that allow us to look through the lens just before we snap the picture. The connections between the photograph of John and the glimpse of John are then thorough.

We project much of what we know about a framed glimpse to the blended space in which the representation is fused with what it represents. Principally, we know that what we see in a framed glimpse is only part of a world that has spatial and temporal extent not directly represented in the framed glimpse. The ability to conceive of a framed glimpse as part of a larger spatial and temporal world may be common across all mammals who have vision, and this tendency to take a limited percept as implying a larger context may extend across all sensory modalities. For example, if we feel something small in the dark, we take it immediately to be part of a larger spatial and temporal world. Human beings, and perhaps dogs and dolphins for that matter, are very adept at conceiving of

rich dynamic scenes with full spatial and temporal continuity on the basis of very partial perceptions.

When we blend a framed representation like a photograph with our concept of a framed glimpse, the photograph thereby becomes a spatially and temporally limited part of a rich dynamic world with temporal and spatial continuities and changes that are not directly represented. Our conception of the conditions of photography leads us to project to the blend many elements from the represented scene that have no visible counterpart in the representation itself. If we see a photograph of the middle of a bridge, we routinely and naturally conceive of the bridge as extending beyond the frame. We conceive of the person on the bridge as obscuring elements behind her.

But of course we can do just the same thing with a painting or a sketch. We project to the blend elements that correspond to our understanding of the reality of a framed glimpse even though there is no visible counterpart of them in the representation itself, and we do this even when we know that the representation is fictitious. In the blend, the painted woman on the painted bridge is obscuring something from our view even if the painter invented both her and the bridge.

In the case of Olga, the blend derived from all three contributing spaces - that is, the representation, what it represents, and a framed glimpse of what it represents - is reified: this blend is "true" in her world, in the following way. Olga's world has paintings, in fact the same paintings that exist in our world. (Toward the end of the story, we learn that most of them are in the National Gallery of Art.) But in Olga's world, those paintings actually are rich dynamic worlds of their own, and the few elite viewers in the world who in fact see properly, that is, with intelligence and open-minded insight, can indeed see the dynamic painted worlds that the paintings present. When they look at paintings,

they see that the people move, the sea rolls, the wind blows, vehicles enter and depart from the scene.

This emergent structure in the blend—rich, dynamic worlds inside the paintings—comes in part from projection of what we know about a glimpse through a window or portal. We know that if we prolong the glimpse to a stare, we might, looking through the portal, see change, dynamism, movement. Just so, in Olga's world, if you are talented and trained and you stare at the painting, you might see change, dynamism, movement. Why do you see it? In Olga's world, the answer is straightforward: because it is *there*.

Olga, of course, is one of those who see properly. When she looks at a painting, or at least a certain painting, she can see the people in it move, breathe, and act, because in the blend they in fact do, and in Olga's world, the blend is real. In the reified mental array that blends the painting, what it represents, and a prolonged view of what it represents, the representation of a person is not merely a person but indeed a person who has received very full projections from our notion of staring through a window at a world: the blended painted person can move, converse, think, plan, become hungry, eat, and so on. Yet the projections from the space of the person are not complete: in this blend, these painted people do not age. With a few exceptions, they are unaware of anything outside the world of the particular painting they inhabit.

We are all familiar with a basic "Picture World" blending template. We use this template routinely. In it, there is a further set of correspondences between the representation and what it represents, as follows. Suppose that in our real world we have a bridge over a canal. Well, something can literally be part of that scene. If the physics works out right, that thing can literally be put into the scene or removed from the scene. For example, we can row a real gondola into the real scene. Over in the representation, that is, the picture, there

can be individual representations that can be created there; they can be erased or otherwise made invisible. So, for example, the painter can do something with paint and a paintbrush that results in the existence of a representation of a gondola as part of the represented scene. There is an outer-space correspondence, that is, a correspondence between two of the contributing spaces, that connects two acts: putting something into a real scene, and taking some action that results in a new element in a representation. This correspondence connects two caused changes and their visible results. That outer-space correspondence can be compressed in our routine "Picture World" blending template to yield, in the blend, a blended causality. The blend fuses these two caused changes, so that the performing of actions that result in a representational element in the representation is fused with "putting" what it represents "into" the "scene." We say, "the painter put a gondola into the painting." Of course, we are not at all deluded: while a gondola must exist before it can be rowed into the Grand Canal, the exact flat composition of paint that represents the boat in the representation does not in fact exist as such to be "put" into the picture until the artist is quite finished taking the artistic action. We use such expressions all the time, as when we say that the artist "put some flowers into the sketch" but then "took them out," or "Hey! You forgot to put Grandma into your sketch." The blend that fuses the representation with what it represents gives a very natural way to think and speak about representations at human scale. It lets us recruit for the purpose of talking about representations and their creation the deeply understood logic of manipulating objects. So our notion of the creation of a representation already has some structure that can be projected to the blend to support the idea of "putting" an element "into" the representation. This blend has some remarkable emergent structure: we can for example "put" a "mountain" into the picture. Indeed, we can "put" "the moon"

or “the sun” into the picture, even though in the real world we cannot perform the corresponding action.

There are other forms of art in which the notion of "putting" "something" "into" the representation is even more highly motivated. For example, children can make pictures by putting prefabricated stickers or plastic laminations onto a surface. There are additionally genres of adult art in which the artwork may have a real dried flower or some other real element right in the picture, placed there by literally taking it and sticking it into the artwork.

There is yet further useful structure in what we know of looking through a portal onto a scene. One of the things we know about a window or portal on a real scene is that we can throw things through it or go through it ourselves, and then be part of what we previously only saw. We can project to the blend this action of “entrance,” to give, in the blend, the possibility of moving something from our world into the picture world.

In fact, we have all had the experience of pushing this standard "Picture World" blending template when we imagine entering the representation. Perhaps we imagine taking our place at the luncheon on the grass, or dining on the food in the painting, or walking down the street in the Dutch village, or even saying something to one of the characters, who then responds to us. The cosmopolitan glut of well-produced photographs of smashingly good-looking people posed receptively and (in the blend) "looking at us" (or even "beckoning us with their eyes") owes its existence to our mental ability to enter the scene and interact. When you think of it, our ability to be transfixed and absorbed by a small, two-dimensional, static photograph of a beautiful human being is a deep enigma, explained, I propose, by the uniquely human ability for advanced conceptual integration, and in particular for the construction of a blend in which

the representation is the thing represented and we can interact with this representation.

The enigma is no less enigmatic in the case of real-time video, with which, of course, we cannot actually interact. Although any mammal, looking at a video, might respond to cues that suggest that a train is rushing toward it, and might attend to cues that suggest that it is looking at a member of its species, could a dog or a chimp, when presented with the appropriate video image, mentally insert itself into an imaginary blend and mentally interact with the elements of the blend? Could it visibly act out that interaction?

Olga's world reifies the "Picture World" blend and additionally provides the possibility of moving an object from our world into the picture world. The man who stole Olga's coat as a means of compelling her to marry him hid it not under a rock or up a tree or in any other normal locale in our world, but instead inside a painting, of Venice, by Canaletto. Within the logic of Olga's world, he literally "hid" it "in" Canaletto's painting. The coat is there, in the painting, in the exact sense that it was here, outside the picture, where any actual coat ought to be, but he moved it from here to there, and now it is there and not here. Olga's coat, in accordance with the physics of our world, can be in only one location. But in the hyper-blend that comes of blending Olga's Selkie world network and her Picture World network, this location can literally be inside a painting, and there is a means of moving things from locations outside the painting to locations inside the painting.

Picture World blending networks can vary in the projections to the blend and so have different logic in the blended space. Consider, as an illuminating contrast to Olga's Picture World, the Picture World in *John's Picture*, a book for younger children.[2] John receives a new set of colored pencils and draws a house on a piece of paper. He draws a little man standing in front of the house. Then

he puts down his pencils and goes to have his supper. It turns out that he has left behind him a Picture World, but one quite different from the Picture World in Olga's World. In John's little picture, the little man can perceive the pencil that is left lying on the paper, and he can bring it into his world, and he does. Because he feels lonely, he draws a little woman to be his wife. She is evidently aware that she is being drawn and is quite happy about it, and even as she is being drawn she is just as real as he is. This little wife, with some help from her little husband, draws a little boy and a little girl. The husband draws some extra rooms for them at the back of the house. Then the whole family draws a backyard. The boy draws a dog. The girl draws a cat. The cat, as it is being drawn, draws a mouse to chase. Life goes on. Why not?

Later on, after many domestic adventures, the little man is standing out in front of the house, thinking of how empty it looks, when John returns and picks up his pencil. The little man's wide-eyed expression, pursed mouth, and hands-on-hips posture as he looks in the direction of John's fingers suggests that the little man can perceive at least something of the outside world. If we take that interpretive line, then we are projecting to the residents of Picture World at least constrained abilities to perceive at least parts of the external world, to interact in at least limited ways with the external world, and even to understand some of the causality of representation and its role in their existence. Indeed, they can themselves take advantage of those causal patterns and change their world by drawing it from the inside. By contrast, the residents of the Picture World of Venice in Olga's World do not seem to have these abilities. In *John's Picture*, it is unclear whether John can himself see that his drawing is a Picture World. At the moment when John returns to look at his picture, there are no changes to be seen: the little man is in front of the house, standing in exactly the spot where he stood when John left. The little man's new family is inside the house, hidden by

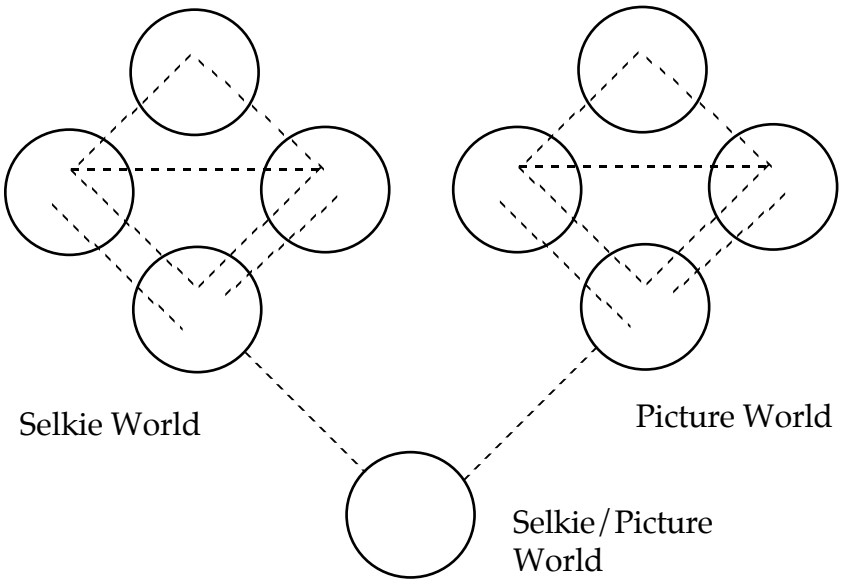
happenstance from view. All the new drawing done by the little man and his family lies behind the house. So, conveniently and intriguingly, there is nothing new for John to see. Would the cosmos allow John to draw a new little wife for the little man? What would happen to the other wife if he did? I have heard children explore these possibilities. But not to worry: John draws only a garden and then, like all good children, goes contentedly to bed. The little man then draws a note for the milkman and fastens it to the door and goes to bed, too. How many days could they all go on living this way?

Olga's ignorance of the fact that her suitor hid her coat in the Canaletto painting presented her with a difficulty, but she overcame it, partly by studying art history to help her locate its hiding place. When she at last locates the painting, she faces a far greater challenge. As the suitor-thief had anticipated, it is not so easy for the land-bound selkie to take the coat out of the painting. To get to it, you must first physically enter the painting. But Olga cannot do that; she is too stout to squeeze through the frame. More daunting still, there is nothing but water across the bottom of the frame. Olga, massive and cumbersome, would fall into the water, and, unable to swim in her present unfortunate form, would drown. It is extremely witty to manipulate a selkie through fear of drowning. What better way to remind her of her vulnerable state? But why can't she simply remove the frame, add more canvas, paint more picture, including a walkway to the quay, and walk in? Apparently, the portal to a Picture World is set by the original creator and cannot be recreated. Presumably, if you create a new picture with a new portal, even if it incorporates the old one, and enter it, then you are in a different Picture World, not the one created by Canaletto, and not the one where the coat is hidden. Or perhaps this is a question we never think to explore.

Reifying a blend that contains a representation into which objects can be placed and out of which they can be taken is extremely common in the world's cultures, from myths in which people die and "become" constellations, to cartoons in which "cartoon characters" throw something at what are represented to be members of their audience, only to have these represented members of the audience leap into the frame of the television to interact with the "characters," to chase them, even sometimes to drag them out. Such artful tricks are widely deployed and remarked.

Olga's world is a blend of two blending networks. One is the blend in which there are selkies, Selkie World. The other is a Picture World blend in which representation is compressed: in this Picture World network, the outer-space representation link between two separate mental inputs is compressed into uniqueness in the blend, so that the representation and what it represents are fused there into a single element. In this Picture World blend, the painting of the water really is water, for example, even as it is part of the painting. The Picture World blending network in Olga's World has, as mentioned, yet another input to the blend: the concept of a portal, such as a window, on a real scene. Projecting *portal* to the Picture World blend results in a Picture World that is much fuller than our view of it, a Picture World into which we can insert elements from the external world, such as a coat.

In the blend of blends that comes from blending these two blending networks, there is a selkie, and her coat can be hidden inside a painting.



In Olga's world, although the separate Picture Worlds that correspond to individual pictures are rich, they do not possess anything like the completeness of our world. Someone who enters this world from the outside finds that the world inside the Picture World fades out. If you are in the Canaletto Picture World, and you walk through the marketplace to where the side streets lead deeper into the city, and you open yet one more door, you are then confronted with "impenetrable grey mist." There isn't anything there, you see. As a character in the story says, "It's a painting. It only goes so far." There are other ways in which the Picture World in Olga's world is unlike our world, some of them influenced by projections from the representation input. For example, one can enter the Canaletto Picture World, and take a cooked chicken away from the marketplace and dine on it. But when you go back, the chicken is still there. "It's a painting," the story explains. "When you go back, everything will be just exactly as it was before you came."

Well, not exactly. Olga recruits a young girl to help her. This girl, Charlotte, is a talented but solitary child, adept at solving puzzles. She is visiting

Ocracoke in November with her adequate but bored mother and adequate but distracted father. Through Olga's tacit coaching, Charlotte learns to see the people moving in the Canaletto painting. It is not clear to the reader that even a talented and motivated human child could perceive the Picture World of Canaletto's painting of Venice without Olga's training and influence: Charlotte encounters the painting in Olga's home, which is perhaps a magical place itself. Olga sings, puts her arm around Charlotte, and unpins her own long hair so its smooth waves brush across Charlotte's bare arm. Charlotte sees, and a few minutes later goes through the frame to retrieve the coat. Charlotte is much smaller than Olga, and she can swim very well.

In general, "Picture World" is a generic double-scope conceptual integration network which we have at our mental disposal to apply to any picture. It guides the mental act of blending and offers options. It does not dictate all the details of the particular picture world. For example, some picture worlds can be entered by outsiders, others cannot. In some picture worlds, a visitor from outside the picture can be perceived by those who inhabit the picture, but in other cases, the visitor is invisible to the natives.

In Olga's world, the picture worlds can be entered, at least by those who have the knack to see that they are picture worlds. Insight brings new possibilities, a central theme of this story. In Olga's World, the usual blend of understanding and seeing that we all know and deploy ("I *see* what you are saying") undergoes remarkable conceptual development. Charlotte must work on her literal ability to see. She must strive to attain advanced vision. As she looks at the painting, its elements and their movement become clearer and clearer. Seeing better, she understands deeply. She already had, as Olga knew, talent in that direction: solitary and friendless Charlotte spent her time on jigsaw puzzles, looking at each piece, seeing its significance, perceiving its place. After

their first meeting, Olga and Charlotte worked together on jigsaw puzzles, and Charlotte improved. The idea that Olga might have superior perceptual abilities is naturally projected to her from our knowledge of a seal: we are familiar with the idea that many animals have perceptual abilities we lack—the ability to hear sounds we cannot hear, to see patterns we cannot. Olga explains to Charlotte why she attends to people: "I like to piece together their actions in order to understand their thoughts." Charlotte has honed the identical knack through inspecting her mother and father. She turns it on Olga, too, and figures her out. She sees. She looks at the Canaletto painting, and she sees.

Charlotte hooks her foot on the frame, which turns out to be as solid as a rock banister (because it is a rock banister), and throws herself over the banister through the frame into the Grand Canal. When she splashes down, she can indeed swim to the side of the canal. Good thing! Needless to say, there are problems. She is nearly run over by a gondola, because in this world, the residents of Picture World cannot perceive the visiting girl. She is in their Picture World but not fully part of it. She has some abilities they do not, which come from her powers when she is not in the painting. But she also has some abilities they do have, such as the ability to move about in their three-dimensional space. The fact that they can neither see nor hear Charlotte is evidence of the selective nature of the projection and the fact that from identical inputs we can develop quite different blends. There are many examples of "picture world" blends in which the natives can interact with the tourists. And indeed, Charlotte can interact with them bodily: she must clear out of the way of the pedestrians as she is walking down the street or they will bump into her, and she must avoid being run over by the gondolas or poled down by the gondoliers. In Charlotte's Venice, the one she enters by splashing down into the Grand Canal, all the elements are truly there, in the sense that, as bodies, they take up space and

conform to familiar force-dynamics. Nobody moves by flying, for example, and the characters imported from outside the painting cannot walk through walls. If you fall into the water, you must swim. The one exception to this logic is that someone in the picture who has been imported from the world outside the picture can exit picture world through the picture frame, the portal, but to do so still must reach the frame and propel herself through it. Visitors to Charlotte's Venice from outside that particular picture world can perceive everything in it, but the Venetians themselves cannot perceive what has entered their world from the outside. If this seems to make sense to you - and of course it does - it is because you are a double-scoping cognitively modern human being.

Charlotte, having landed in the Grand Canal, does manage to avoid being run over by the gondolas and poled down by the gondoliers. But then she arrives at the edge of the canal, and the water level is two feet below the street level. How can she get up? At this point, the story needs yet another crucial blending network to proceed. It arises in the following way. Paintings form a category. For each of those pictures, there is a specific "picture world" blending network. Those "picture world" blending networks *also* form a category, with outer-space analogy connections *across* all the networks. Mentally, you are free to take any number of "Picture World" blended spaces and blend them together. When you have finished, elements from the different "picture world" blended spaces will now inhabit the same hyper-blended picture world.

For example, I have often seen a particular advertisement in airports that represents such a blend of several blended spaces. The advertisement shows images taken from many famous paintings, of people playing musical instruments. In the advertisement, they are all newly arranged as a little orchestra whose members look quite different from one another, since they keep the artistic style of their original paintings even as they are projected into this

many-input blend. The slogan of the advertisement asks whether you, the traveling business manager, have all of your resources playing together in harmony. (I forego analyzing the staggering creativity of the blend in which the resources of the traveling business manager are all people playing musical instruments, and in which differences between the business resources are differences of artistic style of representation. Then, of course, there is the blend in which I am the traveling business manager!)

One of the available inferences of this advertisement is that resources that are perfectly good in themselves can be quite uncoordinated when assembled: so it is not sufficient in business merely to gather good people and resources; you must also configure them just right. Therefore, you need to hire a consultant. Indeed, you need to hire the consultant who works for the company that placed the ad. In the world of art presupposed by this blend, there is stylistic consistency within each painting, and the artistic style used for representing the musician in the painting is consistent with the artistic style of representation used generally throughout the whole of the painting, but assembling the different musicians can create stylistic inconsistency, a clash, through no fault of the individual elements. In the blend, where each resource is a painted figure, the resources, which are internally consistent, each within itself, fit badly with each other. Similarly, in the world of music, the musicians who play in tune in the scenes from which they are drawn can be jointly and relatively out of tune when assembled. The inference in the blend is again that the resources may work fine by themselves but nonetheless not work well together. So you need a consultant to ensure harmony.

Here is how Olga's world involves just such a hyper-blend of many Picture World networks: Charlotte, having swum to the edge of the canal, and struggling to scale the two feet of smooth, wet stone between the water line and

the street level, is assisted by Antonio, Ranuccio, Celeste, and Catherine, all children about her age. Why can they see her? Because they have been sent by Olga from *other paintings,* that is, from portraits of themselves, into Canaletto's Venice, expressly to help the adventure. More accurately, they have been projected from their own Picture World blends into the hyper-blend that receives inputs from several Picture Worlds. In this hyper-blend, the Canaletto Picture World supplies the principal setting.

Antonio, Ranuccio, Celeste, and Catherine are visitors, like Charlotte, and as such cannot be perceived by the Venetian residents of the Canaletto Picture World. But they can perceive other visitors, and so can see both each other and Charlotte. They retain features of their own Picture Worlds: they are ignorant of historical events after the period of their paintings; they wear the costumes of their portraits, although they can change clothes; and they have the manners of their epochs. Rannuccio is from Florence and Antonio from Milan, and they accordingly participate in the city-state rivalries of their period. When Charlotte, realizing that they are not native denizens of Canaletto's Picture World, asks, "You are . . . paintings?" (page 61) Rannuccio responds, with a certain amount of disdain, "Of course. We are not Venetians." The story explains, "Neither of them thought much of any city besides their own, although for the sake of politeness, Rannuccio said nothing of Milan and Antonio said only that he preferred Florence, of course, to Venice." (page 61). These five children, united in the goal of restoring Olga's coat to her, become fast friends. The Picture World develops the all-important emergent structure that Charlotte now has friends, for the first time in her life, and understands what it means to have friends. This is one of the two great realizations she achieves during her adventure in Picture World, realizations that guide her for the rest of her life.

But however real these friends are to Charlotte, they still come from Picture Worlds, and so can enter only those realms of a Picture World that belong to a Picture World. This is why they have never found Olga's coat, we learn. As the children scour the city, Charlotte, with her ability to see, stops outside an arched doorway without knowing consciously why. At the back of the archway, in the shadows, it turns out, is a glass door. As she walks closer, she sees a tiny electric doorbell, and then above the door an address: 5478-B. Puzzle-solver that she is, she understands immediately that Venice certainly never contained an address like that. She of course seeks to enter:

> I turned the knob and pushed open the door. Celeste, Antonio, Caroline, and Rannuccio came behind me, but when they reached the doorway, they found they could go no farther.
>
> "This is not the painting," said Antonio. (pages 65-66).

At the heart of the story, once Charlotte, in a dusty room full of hunting trophies, has assured herself that the bundle on the table does indeed contain Olga's coat, and has starte with it for the door, we are confronted with the most challenging blend in this story. A previously unnoticed harlequin, obscured by the dust as he sits mostly hidden in a chair in the corner, asks her, "What would you want with that old thing?"

Physically, it is clear that the harlequin presents no threat to Charlotte. At one moment he is propping his elbows on his knees, at another flopping wispily back in his chair. He is disarming yet spooky. He and Charlotte have a conversation, an odd one, in which Charlotte actually speaks aloud only the first of her many lines. After that, he responds directly, it seems, to whatever she thinks. He knows, too, all the facts about Olga, Ocracoke, and Charlotte's life. Why not stay? he asks Charlotte. After all, Olga hasn't changed anything: Charlotte still has no friends back home and she is doomed back there to

accompany her mother to endless boring tea parties. But, ah, if she stays, she will have friends, and no one will miss her at all. So goes the harlequin's logic: Olga doesn't really care about Charlotte; she only wants the coat. Olga cannot fit through the frame. She can't actually force Charlotte to leave then, can she? Stay, he says - you'll never grow old.

That last line is his mistake. It might have been a good argument for an adult, but Charlotte realizes when he says it that she wants to grow up, she wants to tell her mother she won't go to her stupid tea parties anymore, she wants to go to college - an amazing thought for a girl in her era - and she wants to find real puzzles to solve. She bolts out the door hollering, "Thank you!"

Is the harlequin real? If so, he is a fabulous blend of many things: an actual Venetian Mardi Gras harlequin wearing a mask, a mind-reader, a being whom the hunter has captured and transformed into a trophy, maybe a puppet or some similar toy or automaton, perhaps even the hunter himself: The harlequin has many of the hunter's goals, strategies, preferences, and tricks, but none of his predatory behavior. He has the spooky aura of a harlequin but the rootedness of one of the hunter's stuffed animal trophies.

Or is the harlequin a figment of Charlotte's mind, or a symbol meant artistically to represent her thinking? In that case, we understand the harlequin by using a different, rival blending network, as follows: Disintegration is a routine part of integration networks. We can think of our identity as unitary, or alternatively decompress our identity into two inputs: self now versus self ten years ago; practical self versus passionate self; self in New York versus self in San Francisco. There can be two or more inputs in such a blending network, each with a different aspect of the identical self; the unitary blend fuses them all into one unitary self. But once we have these separate selves decompressed, broken out as inputs to the unitary blend, there is a different possibility: we can reblend

the separate selves to make a different blend in which we do not fuse these selves but instead place them in each other's company. In this new blend, the selves can converse, contend, or concur. We can use props, such as a mirror, to give support to a blend in which there are two different but identical selves, talking to each other. "How could you have done that?" or "You don't understand how you strike people" or "You must be a spy" we say to our self in the mirror.

Alternatively, we can make a blend in which both of the aspects of a self are represented in the blend, but do not share an identity. In that case, in the inputs, there are at least three people: two different selves that are identical, and an additional third person who is not connected by an identity relation to the other two. In this blending network, we project one of the aspects of self to our identity in the blend, but the other aspect of self to the separate identity of the third person in the blend. Then, when the third person addresses us in the blend, it is a part of our self that is talking. It is easy to activate such a blending pattern. For example, imagine a train conversation in which some imaginary traveler is a truth-teller, able to see and express to us one of our most closely held desires, maybe even one we somehow knew but were not willing to admit to ourselves. The harlequin in Canaletto's Venice can be interpreted as, in part, just such a figure: he can express Charlotte's doubts. Is this because he is a literal mind-reader, or is it because he is a product of Charlotte's mind? The story does not specify.

Coat under arm, Charlotte parades with her friends back to the Grand Canal, where they all hop on a gondola headed toward the picture frame, which is of course still suspended over the canal, invisible to the Venetians. Her friends, with goodbyes all around, push her up and through it.

The story of the Ocracoke selkie is an aggressive and explicit hyper-blending of two conventional blending networks—a first network that blends a

representation, what it represents, and a glimpsed view through a portal of what it represents, and a second network that blends an animal and a human being. The resulting pyrotechnic hyper-blend not only entertains us with its creativity, but also speaks directly to the heart of the psychological matter. The first-person narrator of the entire outermost, overarching story is a woman named Marguerite, who is recounting to the reader the childhood visit she paid to her great-aunt Charlotte. In Marguerite's narration, there is a taxi ride to the National Galley of Art, and during this taxi ride, great-aunt Charlotte recounts the story of her childhood visit one November to Ocracoke. So we have Marguerite narrating the story of great-aunt Charlotte's narration of the story of Ocracoke. Great-aunt Charlotte, now no longer the child of jigsaw puzzles but instead Marguerite's revered and slightly distant ancestor, begins by saying to the child Marguerite: "I was just about your age the year that we went to Ocracoke for Thanksgiving. My only brother was away at college, so it was just my father, my mother, and myself." And, a little later, speaking of her home life, she reveals, "I had a governess to teach me, so I didn't go to school and I didn't have any friends. I had never had friends, and I didn't know that I was missing them. In fact, I'd have to say I was something of a lump." (page 47) Marguerite the child is being invited to make a blend that literary critics call "identification" but that I would call a compression of the analogy between Marguerite the child in one input and Charlotte the child in the other.

In the blend, by identifying with the child Charlotte as she makes friends with Antonio, Ranuccio, Celeste, and Catherine, Marguerite can understand imaginatively what it is like to have friends. She can have a sense of who she is, and develop ambitions about growing up, and in fact grow up a little, or at least be set on a path in that direction. While Great-Aunt Charlotte is recounting her story, she and Marguerite are on their way to the National Gallery of Art, where

they will see, it turns out, the paintings of Antonio, Ranuccio, Celeste, and Catherine, which do in fact exist, not only in the nested worlds of the story, but in reality. I have now seen some of them, in the National Gallery of Art.

The implied reader of the story is, of course, just about the age of the child Charlotte and the child Marguerite. A potential basis of the psychological power of the story for the implied reader lies in the three-way blend of Charlotte as a child, Marguerite as a child, and the actual child reader. The child reader, projecting herself into a fabulous and impossible blend, can imaginatively take on the experiences, dispositions, and perspectives of both Marguerite and Charlotte, and make great realizations while inside this fantasy, and, further, project those realizations back to her own "real life." Blends need not be false to be true or powerful. But neither exhaustive truth-value with respect to our world nor even mere possibility as judged by the principles of our world is crucial for the power of the blend as a human tool of reason, judgment, and decision. Through double-scope blending, fiction can deliver truth, with salutary influence on our lives.

Conceptual Integration and Consciousness Studies

The relation of conceptual integration theory to other theories.

Conceptual integration research makes hypotheses about the essential nature of higher-order modern human cognition and addresses basic questions of human mental and behavioral singularities. It would be convenient for consciousness studies, as currently structured, if blending were an epicyclic phenomenon to be accounted for by adding an optional epicycle to existing theories. But it is fundamental to all of the major areas of consciousness studies. Here I mention a few of them:

Theory of mind. By "theory of mind" I mean the recent, specific hypothesis that human beings evolved a special-purpose mental module enabling them to take the perspective of other human beings, to identify with them, and so to understand them as intentional beings like oneself. "Theory of mind" is often coupled with the hypothesis that the extraordinary difficulties autistic children experience in social pragmatics and social learning are caused by a genetic defect that results in improper development of the so-called "theory of mind" module. (Baron-Cohen 1988, 1983, 1995. See also Sigman & Capps 1997.) Michael Tomasello proposes a fascinating hypothesis according to which species-unique human cognition derives from the uniquely human ability for "theory of mind." In *The Cultural Origins of Human Cognition* (1999), he writes:

> My specific hypothesis is that human cognition has the species-unique qualities it does because:
>
> • *Phylogenetically:* modern human beings evolved the ability to "identify" with conspecifics, which led to an understanding of them as intentional and mental beings like themselves.
>
> • *Historically:* this enabled new forms of cultural learning and sociogenesis, which led to cultural artifacts and behavioral traditions that accumulate modifications over historical time.
>
> • *Ontogenetically:* human children grow up in the midst of these socially and historically constituted artifacts and traditions, which enables them to (a) benefit from the accumulated knowledge and skills of their social groups; (b) acquire and use perspectivally based cognitive representations in the form of linguistic symbols (and analogies and metaphors constructed from these symbols); and (c) internalize certain types of discourse interactions into skills

> of metacognition, representational redescription, and dialogic thinking. (page 10).

"Theory of mind," the ability to understand conspecifics as intentional and mental beings like oneself, is, I propose, an important subcase of the ability for double-scope blending:

> • *Phylogenetically:* Rudimentary capacities for blending are evident in mammals. Modern human beings evolved the advanced ability for double-scope blending, which enabled them to be innovative in many ways, and in particular enabled them to blend the self with other human beings, so as to understand conspecifics as intentional, mental beings like oneself. (But, using a range of different projections, double-scope blending also enabled cognitively modern human beings to make blends of self with fauna, flora, and inanimate objects. These different kinds of blends have different utilities. No doubt the blend of self with conspecifics was particularly adaptive.)
>
> • *Historically:* Double-scope blending made possible dramatically powerful new forms of cultural learning and sociogenesis, making it easier to accumulate the products of double-scope blending over time. Double-scope blending made human culture and cultural processes possible, and is responsible for art, science, religion, language, mathematics, fashions of dress, and other human singularities.
>
> • *Ontogenetically:* Human children are born with the capacity for double-scope integration. Cultures stand ready with the products of conceptual integration accumulated over time: languages, complex gestures, weights and measures and money, stuffed

> animals, fashions of dress and posture, social rituals, fractions, religion, ... Partly because children can form blends of self and other, but also partly because they can form blends of all sorts, children can acquire these culturally-developed products of blending.

To the extent that "theory of mind" is viewed as adaptive and explanatory, conceptual integration must be viewed in the same light, since the ability to form a blend of self and other is a special case of blending, in one domain. But conceptual integration theory has additional attractions.

First, it seems implausible that "theory of mind" could provide all the capacity needed for modern cognition. Tomasello writes, "My particular claim is that in the cognitive realm the biological inheritance of humans is very much like that of other primates. There is just one major difference, and that is the fact that human beings 'identify' with conspecifics more deeply than do other primates" (page 14). In *The Way We Think*, Fauconnier and I explain many human discoveries and creations that do not appear to follow exclusively from the ability to create a blend of self and other. Social cognition is indeed necessary for significant cultural accumulation, and, to be sure, the ability to "stand on the shoulders" of others is indispensable to human cognition. But that ability alone is inadequate to account for the details of the invention of complex numbers, hyperbolic geometry, money, grammatical constructions, counterfactual thought, ... The phylogenetic development that is needed for these cases, and that is also needed for blends of self and other, is the advanced capacity of double-scope blending. The capacity that distinguishes human beings in the cognitive realm lies one level of generality above "theory of mind." The origin of human cognition lies not specifically in blending within the domain of self and other, but

at a higher level, in the more general capacity for double-scope blending over many domains.

Second, Tomasello is correct to emphasize the importance of the "stabilizing component" in the accumulation of knowledge: "The process of cumulative cultural evolution requires not only creative invention but also, and just as importantly, faithful social transmission that can work as a ratchet to prevent slippage backward . . . . Perhaps surprisingly, for many animal species it is not the creative component, but rather the stabilizing ratchet component, that is the difficult feat" (page 5). We must acknowledge the extent to which innovation results from collaboration (in the broad, "perspective-taking" sense) rather than from lone genius. Yet the collaborating mind requires strong powers of mental creativity, as does cultural learning. Tomasello emphasizes the stabilizing component, but the creative component deserves equal emphasis. Conceptual integration theory treats the creative component and the stabilizing component not as two partitioned components but instead as seamlessly interacting exercises of the same remarkable mental ability for conceptual blending. For Tomasello, "The complete sequence of hypothesized evolutionary events is thus: human beings evolved a new form of social cognition, which enabled some new forms of cultural learning, which enabled some new processes of sociogenesis and cumulative cultural evolution. This scenario . . . posits one and only one biological adaptation . . ." (page 7). For me, the complete sequence of hypothesized evolutionary events is this: human beings evolved an advanced form of cognition, double-scope blending, and this advanced form made possible, among other things, new forms of cultural learning, sociogenesis, and cumulative cultural evolution.

Third, the evolutionary hypothesis proposed by conceptual integration requires only an increase along a gradient of ability: double-scope blending

requires many pre-existing abilities to be in place, but otherwise consists of only an advance along the gradient of a capacity that we see widely manifested in the mammalian world. In recent lectures delivered at, e.g., Stanford University, Tomasello provides important evidence for this view. Chimpanzees (*pan troglodytes*), he reports, in my words, not his, may have greater ability to blend self and other than has heretofore been recognized. In very narrowly and ingeniously contrived experiments in which a dominant and a subordinate chimpanzee interact in competition for food, that is to say, situations in which the chimpanzee already has strong domain-specific mental scaffolding (food, dominance) to assist in the difficult blending of self and conspecific, the subordinate chimpanzees show some ability to behave in ways that suggest a partial ability to understand the perspective of a dominant. This research is suggestive of the ways in which the ability for blending interacts differentially with domain-specific knowledge and abilities.

Fourth, it is widely acknowledged that children assigned to the pervasive developmental disorder spectrum, of which autism is deemed to be a part, frequently show strong capacities for conceptual integration in domains other than social pragmatics. Asperger syndrome children in particular often display such forcible abilities for conceptual integration that non-specialists have difficulty imagining that their socially anomalous behavior could be the result of cognitive deficit rather than poor character. If theory-of-mind social cognition were the root of the special capacities of human cognition, then impairment of social cognition in these children might produce similarly profound deficits across all those special cognitive capacities. But, on the contrary, Asperger children can manifest great impairment in social cognition and yet have strong blending abilities in other domains. I propose therefore that these cognitive deficits should be explored as cases in which conceptual integration encounters

interference developing and working *in a particular domain*. Such interference, to be sure, would inevitably cause collateral problems in other domains, depending on the severity of the interference, but not necessarily to the same degree.

Despite these differences, the theory of "theory of mind" sketched here is friendly to Tomasello's, taking his as, for the most part, upwardly-compatible.

Theory of language. Neither phylogenetic evolution for a specific language module nor evolution of theory of mind per se is the origin of language. As Fauconnier and I discuss at length in chapter nine of *The Way We Think*, what made equipotential human language possible was the evolution of double-scope blending. Cognitively modern human language and cognitively modern social cognition came up in parallel phylogenetically, both made possible by double-scope blending, each supporting the development of the other.

Theory of memory. We might have expected evolution to build our brains in such a way as to prevent us from activating memories that clash fundamentally with our present situation, since calling these mental arrays to mind risks confusion, distraction, perhaps disaster. As Glenberg observes, "To avoid hallucination, conceptualization would normally be driven by the environment, and patterns of action from memory would play a supporting, but automatic, role" (1997: 1). Yet we routinely activate memories that are at odds with our present condition. Typically, we do not confuse the memory with the present condition. Just as remarkably, we can activate memories regardless of their temporal relation to the present or each other. Blending might help explain the existence of these remarkable features of memory, as follows: Blending needs at least two (often unconscious) mental arrays to serve as active inputs to the blend, and if memory can supply one or more of them, and thus subserve effective and creative blending, these memory features would have been, to that

extent, adaptive, all the more so once double-scope blending evolved. In short, it is worth considering the ways in which blending and memory might have co-evolved.

Theory of consciousness. It is remarkable that almost all blending takes place below the horizon of consciousness, and that typically only the product, not the process, of blending is apprehensible in consciousness. This is an area of inquiry in which blending research and consciousness studies seem likely to join forces.

References

Baron-Cohen, Simon. 1988. "Social and pragmatic deficits in autism: Cognitive or affective?" *Journal of Autism and Developmental Disorders* 18, 379-401.

Baron-Cohen, Simon. 1993. "From attention-goal psychology to belief-desire psychology: The development of a theory of mind and its dysfunction." In Simon Baron-Cohen, Helen Tager-Flusberg, and Donald J. Cohen, editors, *Understanding other minds: Perspectives from autism*. New York: Oxford University Press.

Baron-Cohen, Simon. 1995. *Mindblindess: An essay on autism and theory of mind.* Cambridge MA: MIT Press.

Carpenter, Malinda and Michael Tomasello. 2000. "Joint attention, cultural learning, and language acquisition: Implications for children with autism." In Amy Wetherby and Barry Prizant, editors, *Communication and language issues in autism and pervasive developmental disorder: A transactional developmental perspective.* Baltimore: Brookes. Pages 31-54.

Fauconnier, Gilles. 1997. *Mappings in Thought and Language.* Cambridge University Press.

Fauconnier, Gilles and Mark Turner. 2002. *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities.* New York: Basic.

Fauconnier, Gilles and Mark Turner. 1998. "Conceptual Integration Networks." *Cognitive Science* 22:2 (April-June 1998), 133-187.

Glenberg, Arthur M. 1997. "What memory is for." *Behavioral and Brain Sciences* 20: 1-55.

Goguen, Joseph. 1999. "An Introduction to Algebraic Semiotics, with Application to User Interface Design." In *Computation for Metaphor, Analogy, and Agents.* Edited by Chrystopher Nehaniv. Berlin: Springer-Verlag, pages 242-291.

Hobson, R. Peter. 1993. *Autism and the Development of Mind*. Hillsdale NJ: Erlbaum.

MacDonald, Elizabeth. 1991. *John's Picture,* pictures by Dave McTaggart New York: Viking.

Meddaugh, Susan. 1996. *Martha Blah Blah*. Boston: Houghton Mifflin.

Sigman, Marian and Capps, Lisa. 1997. *Children with autism: A developmental perspective*. Cambridge MA: Harvard University Press.

Tomasello, Michael. 1999. *The Cultural Origins of Human Cognition*. Cambridge: Harvard University Press.

Turner, Mark. 2001. *Cognitive Dimensions of Social Science: The Way We Think About Politics, Law, Economics, and Society.* Oxford University Press.

Turner, Mark. 2003. The Blending Website: http://blending.stanford.edu.

Turner, Megan Whalen. 1995. "Aunt Charlotte and the NGA Portraits." *Instead of Three Wishes.* New York: Greenwillow Books.

[1] Turner, Megan Whalen. 1995. *Instead of Three Wishes*. NY: Greenwillow Books.

[2] MacDonald, Elizabeth. 1991. *John's Picture,* pictures by Dave McTaggart New York: Viking.