**A Proposed Solution to The Hard Problem: Complexity and Story**

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**Abstract**

(370 words)

Three decades after Chalmers (1995) named it, neither neuroscientists nor philosophers have found a convincing solution to the ‘hard problem’ of conscious subjective experience. Complexity theory suggests a solution that is parsimonious because it does not invoke new principles, while biology provides a model system that makes complexity intuitively accessible. Biological dynamic systems interact according to simple rules (while the environment provides simple constraints) and thus self-organize to create a new dynamic system at the next higher level of complexity. This cycle repeats several times to generate a hierarchy of levels. A leap to the next level is frequently creative and surprising, the new level being governed by new ‘macrolaws.’ Ants, for example, themselves self-organize according to physical and chemical laws but may create, at the next level, an ant nest self-organized according to eusocial laws. A dynamic system only exists while energy flows through it, but it does not necessarily have mass. This is confirmed by authoritative research showing that language, which has no mass, is a complex adaptive system. Body-and-brain are material but the next level of complexity, a *psychological* dynamic system, for example a thought, feeling, image or ideal, is not material. From the interactions of several psychological dynamic systems emerges the next level again, story, and from multiple stories emerges the next level yet again, personality. I present concrete evidence that a specific early story emerges from body-and-brain. I also give evidence that personality emerges from story. A story necessarily captures subjectivity since the teller’s choice of content and emphasis is subjective, even if the content itself is objective. I argue that the ‘stream-of-consciousness’ story (movie) you are currently telling yourself (watching) is your conscious experience, ‘what it is like’ for you to be conscious. Each level of a hierarchy of dynamic systems must necessarily be homeostatic, *at that level.* Elsewhere, co-workers and I present evidence that a dream (a story) supports personality homeostatically. Perhaps the evolutionary advantage of conscious experience, also a story, has always been that it too supports personality homeostatically. Though personality has no mass it meets all the criteria for life. A person, therefore, may be a chimera of two radically different life forms, body-and-brain and personality. This is interactionist duality.

**The hard problem**

Neuroscientists and philosophers tend to choose consciousness as the defining characteristic of human psychology. The hard problem that Chalmers⁠ (1995 pp. 1-4) named is that we cannot explain *conscious experience* reductively in terms of cognitive or neural mechanisms because experience is a subjective state, not an objective function. There are several objective functions associated with consciousness, reportability, internal access, integration, control, focus, and wakefulness, all of which we can, at least in principle, explain reductively because they seem to be the result of cognitive or neural mechanisms: if we can identify the ‘moving parts’ in the mechanism and analyze what they do and how they work together, we have explained the result. But these functions could all occur ‘in the dark,’ or ‘free of any inner feel.’ Chalmers continued: ‘It is widely agreed that *experience arises from a physical basis* … but why should *physical processing* give rise to a rich inner life at all? It seems objectively unreasonable that it should, and yet it does [my italics].’ He argued that, since we cannot use reductive explanations, we need a non-reductive explanation.

Twenty-eight years after the hard problem was named as such, subjective experience still has not been explained. Seth and Baynes (2022) categorized neuroscientific theories of consciousness into four groups: ‘higher order,’ ‘global workplace,’ ‘re-entry and predictive processing’ and ‘integrated information’ but none of these theories offer a convincing explanation of conscious experience. Clark and Chalmers (1998)⁠ argued that external mechanisms and cultural practices are part of consciousness (the ‘extended mind’) and thus recognized more complexity. Clark (2023 pp. 4-6, 217-28) argued persuasively that the brain is a ‘prediction machine’ or an ‘experience machine.’ He acknowledged, however, that his theory does not directly address the hard problem (ibid. p. 213).

It seems that a solution to the hard problem requires a new approach. I give evidence for an explanation that is not reductive but prospective. Experience, I argue, does not arise from physical processing but is a consequence of story, a dynamic system that emerges not from physical or chemical components (except in the trivial sense that everything begins with physics) but from psychological components. Radical solutions to the hard problem have been proposed: conscious experience may not exist (Dennit 1991); conscious experience may be due to an additional ‘fundamental feature of the world alongside of mass, charge, and space-time’ (Chalmers 1995, p14); following Integrated Information Theory, some modicum of experience might be present in any matter, even a proton, that forms an ‘irreducibly integrated Whole’ (Koch, 2019 p 159). My proposal is parsimonious because it does not invoke any new principle but is derived from complexity theory and story. Both have been rigorously studied and neither is controversial.

Since experience is subjective it is likely that an explanation of it will not be exclusively objective but will include other subjective phenomena. Story is necessarily subjective because it is the product of subjective choice. No matter how objective the story’s content, the choice to tell this story rather than some other story and to emphasize this aspect rather than some other aspect expresses something of the subjectivity of the teller. We have told stories and therefore studied them since we first became human. Our current understanding of story is deep, notwithstanding that it is mostly not scientific. Vendler (1999, p. 17) said:

The ethics of lyric writing lies in the accuracy of its representation of inner life. Shakespeare’s duty as a poet of the inner life was … to be accurate in the representation of the feelings of his speaker.

 Saunders (2021, p 6) said:

The way we read [a story] … is the way the mind … behaves in relation to another mind (i.e., the writer’s) across space and time … [The mind] can deceive us, but it also can be trained to accuracy; it can fall into disuse and make us more susceptible to lazy, violent, materialistic forces, but it can also be urged back to life, transforming us into more active, curious, alert readers of reality.

**A prospective model**

 The brain is not a machine that can be analyzed reductively into parts of which it is the sum, but something dramatically different, a *dynamic system.* Imagine a waterwheel in a turbulent stream. If the water stills, the wheel continues to exist but the turbulence vanishes. The waterwheel is a machine while the turbulence is adynamic system, which means that it only exists while energy flows through it. The brain, likewise, only exists while energy flows through it: if its oxygen supply is blocked, it will vanish to be replaced by a mass of dead tissue. For more on dynamic systems see McDowell (2010 pp 12-15).⁠

Because the brain consists of many dynamic systems interacting together, it is a *complex* dynamic system and, because it records what it learns in memory and therefore can evolve during its lifetime, it is also a complex *adaptive* system (I explain these terms more fully below). A machine has a predetermined action. If you wish to change that action, you must alter the machine. A complex adaptive system, by contrast, spontaneously engages with its environment to create something entirely new (Holland 1992 p. 20).

A newborn is a complex adaptive system that moves its mouth seeking to suck. It has never met a nipple or a breast but, if they are offered, it will engage with them (and the mother) and immediately begin to build a relationship, something entirely new. A city is also a complex adaptive system, one composed of many simple dynamic systems of exchange — trades between people — and one that remembers its changes through contract and law. A city continually seeks to engage in new ways with its surroundings.

A complex adaptive system is a prospectivemodelbecause, instead of looking backwards to the brain’s neural components, it looks forward to explain how a brain engages with new possibilities. We need a prospective model not only to explain why we experience red when we see a red pigment or why we experience the taste of honey (experiences we must share with a bear), but also to make room for the highest achievements of consciousness, like the works of Shakespeare or Virginia Woolf.

**Complexity**

Any explanation of consciousness must account for the degree of complexity that consciousness represents. The astronomically complex structure of the human body-and-brain cannot be specified by genes because there are relatively few genes and because no gene specifies a three-dimensional structure (see endnotes [[1]](#endnote-1) & 2; see also McDowell 2010, pp 10-12). Instead, a gene controls the *timing* or *degree* of a development. For example Pinson et al. (2023) recently identified a mutation in humans that increases the degree to which neurons proliferate in the frontal cortex.

Holland (1998, pp. 1-14, 115-18, 121-24, 141-142, 188-190, 202-220, 225-27), Gell-Man and others developed a new paradigm to explain how complexity *emerges*. Complexity *self-organizes* when a group of simple dynamic systems spontaneously interact according to simple rules while the environment provides a few simple constraints, that is, criteria that select which interaction is preserved. The interaction thus selected constitutes a new, *more complex* dynamic system. A group of these more complex systems then repeat the cycle by themselves interacting spontaneously according to simple rules while the environment provides simple constraints. The interaction thus selected again constitutes a new dynamic system *more complex yet*. This cycle can repeat several more times, creating a hierarchy of layers of increasingly complex dynamic systems and it is through such cycles that the astronomical complexity of the human body-and-brain self-organizes spontaneously with minimal direction from genes.

This new paradigm, which has been validated by observations in widely different fields (for more discussion see McDowell, 2010 pp 12-15) requires us to reorganize our thinking. Some researchers state that consciousness is self-organized (Cleeremans et al. 2020, p. 112), or that the mind is a dynamic system (Kirchhoff and Kiverstein 2019, pp 16, 19-23. The other theories identified by Seth and Baynes do not appear to address the complexity paradigm. In general science has been slow to integrate this new paradigm, perhaps because it challenges reductive thought which has been hugely successful in science. Perhaps also because this paradigm is often discussed with mathematics which for most of us is an obstacle. To better explain the paradigm I use biology as an intuitively accessible model.

Next I sketch the hierarchy of complexity in biology, both to make the paradigm more real and to demonstrate that leaps in complexity tend to be surprising.

**Levels of complexity in biology**

 1. A first level of complexity emerges when 21 different small molecules, amino acids, are linked together in a specific sequence, like a string of beads, to create a chain that spontaneously folds[[2]](#endnote-2) into a compact globule, an enzyme. Thus a group of simple components (the chain’s amino acids) interact spontaneously according to simple rules (fold). The chain’s length varies from about 50 amino acids to 33,423, the average being about 400. An astronomical number of different amino-acid sequences are possible but a much smaller number of functional sequences are selected. Each enzyme serves to catalyze one specific chemical reaction and each enzyme-plus-chemical-reaction constitutes a *simple* dynamic system.

2. A second level of complexity, a *complex* dynamic system, emerges when a group of the above simple dynamic systems interact spontaneously according to simple rules — for example the law of supply and demand — to form abiochemical cycle.One cycle, *aerobic respiration*, mimics a fire in your fireplace. It consumes fuel and oxygen, creates carbon dioxide and water and at the same time recharges small molecules that, functioning like batteries, disperse throughout the cell to bring energy wherever it is needed.

3. A third level of complexity emerged when a group of such biochemical cyclesinteracted spontaneously, according to simple rules, to form a *prokaryotic* cell, a bacterium or a blue-green algae.

4. Later in the course of evolution several different kinds of prokaryotic cells interacted spontaneously to form larger and more complex *eukaryotic* single-celled organisms (fourth level).

5. Later yet, a multicellular plant and a multicellular animal emerged from the interactions of differentiated eukaryotic cells (fifth level).

6. A colony like an ants’, bees’, or termites’ nest emerges from the spontaneous social and economic interactions of many individual insects (sixth level). Notice that, for this level, interactions are *not* based on physical (chemical) processing but on eusocial processing. The phenomenon, colony, which emerges at this level has escaped the tyranny of requiring physical explanation: instead its explanation requires *macrolaws* that operate at the higher level of eusocial colonies (Holland 1998 pp. 214-15, 225-30). A macrolaw is constrained by (does not violate) the physical microlaws which precede it but a macrolaw is not a logical derivation of those microlaws.

7. An ecosystem emerges from the interactions of organisms and colonies (seventh level).

8. The biosphere emerges from the interactions of ecosystems (eighth level).

 This schematic account shows that the transition to the next higher level of complexity can be surprising.

**Complex adaptive system**

A cell is an adaptive system because it can remember its components through the DNA sequence of its genes and also can remember any mutation in its DNA sequence (see endnote 1). Thus, through a series of mutations, a cell can adapt and evolve just as, in one lifetime, a brain can adapt and develop by remembering what it learns (Holland 1992, pp 17-20)

Both a cell and a brain are biological adaptive systems while, as said earlier, a city is a non-biological adaptive system. Another non-biological system is the body of law which evolves by remembering past legal decisions and building upon them and another is language which evolves by remembering its vocabulary and adding new words and constructions. [Beckner et al. (2009) provide authoritative evidence that language is a complex adaptive system. Since language is not material, they confirm that a complex adaptive system need not have mass, a fact central to my argument.] In these non-biological examples, the components that self-organize are not chemicals, nor are their interactions physically (or chemically) based. They are based, respectively, on economic, legal and linguistic macrolaws.

A therapy group is also a non-biological complex adaptive system. To the degree that it functions well, it comes alive and closer relationships emerge spontaneously between individuals who talk to each other in the presence of other group members, all of whom change as a result. The group remembers what has happened, especially a new development, and builds upon it.

From the unscripted social interactions of nine individual personalities, spontaneous growth and healing emerges, in part because the members’ nuclear-family-engendered neuroses and narcissistic defenses are not supported. To the degree thatthe group is healthy, functional attitudes like courage, honesty, humor, sensitivity, and relatedness are supported because they generate new life while dysfunctional attitudes like excessive selfishness, withholding or defensiveness are not supported because they are not generative. The group functions mostly as though it were a constructive extended family meeting at the dinner table. Caring is mostly abundant, vulnerability is welcomed and conflicts are at least somewhat resolved through transparent conversations.

Each week the conversations are a surprise: new unpredictable interactions emerge spontaneously. A constructive change in the group may catalyze a similar constructive change in a member’s outside life that is then reported back to the group.

A group does not have a single center of awareness (it cannot speak as an ‘I’) but it does have its own identity. I have run two groups on the same principles for many years and each functions somewhat differently, in part because each has different members and in part because each emerged through its own history. A group is like a theater performance, or a ‘happening,’ a cooperative performance that will be different every time. It only exists for ninety minutes each week because, between meetings, the group vanishes, though its members continue to react to their memory of it. Each group will vanish permanently when we end the group (death) but will persist in memory. Each is an objective reality, not an illusion.

The above shows that a therapy group, like an insect colony, is a surprising new level of non-biological complexity that emerges by self-organization, has a life of its own, and may have a profound effect on its component dynamic systems. Like a colony, a group is *not* based on physical (chemical) processing but on social and psychological processing. Thus we continue to develop evidence that not all human complexity is based upon the microlaws of physical (chemical) processing.⁠ A group still requires neuronal firing and aerobic respiration but these happen at earlier levels of complexity. A group happens at its own level of complexity, controlled by its own macrolaws. At the level of mitochondria -- the site of aerobic respiration -- the group is nowhere to be found.

**Pre-existing possibility**

A dynamic system has another important property. The form that a dynamic system adopts is nowhere specified in a blueprint. Each form emerges spontaneously but there are a limited number of efficient forms available, limited solutions to the problem of form (McDowell 2001). So a mountain stream adopts a serpentine form, as does a raindrop sliding down a window pane and a snake or a weasel moving through a thicket, the serpentine form being an adaptation for moving through or over a resistant medium; so a whirlpool adopts the whirlpool form, whether it be in your sink or in a spiral galaxy; so a fire adopts a fire form (fuel below, flames above, heat radiating out) on this planet and, we can be sure, on any other planet where chemicals burn; so also, in the course of evolution, colonial polyps (primitive marine animals) adopted the fern form to maximize their surface area for filter feeding and then, hundreds of millions of years later, plants on dry land independently adopted the fern form to maximize their surface area for capturing photons, another version of filter feeding (this last illustrates convergent evolution: the two different fern forms look identical); and so also insects, squids, fish, amphibians, many different groups of reptiles and mammals, birds, and even a sycamore seedling have independently discovered the wing form to enable flight (also convergent evolution), so many times that we can confidently predict that on other planets where large life forms have evolved, wings will have evolved there too; so also both cephalopods (octopi and squid) and vertebrates, independently evolved a ‘camera eye’ with pupil, lens, retina and optic nerve: some details are different, but the overall design is strikingly similar because this is the optimal design for an eye (Holland 1998, pp 230-31); so also termites, ants, bees and wasps are not the only species to discover *eusocial* behavior in which individuals live in colonies with only one breeding pair: other insects, a species of shrimp, naked mole rats and, to a lesser degree, meerkats and wolves have also independently discovered this adaptation. Even the globule forms into which a chain of amino acids can fold are limited in number. Each of the available forms is adopted by many different amino-acid sequences, another example of pre-existing possibility (Denton and Marshal, 2001).

There are a limited number of pre-existing possibilities for organization, possibilities always and everywhere presentthat determine how a dynamic system can organize itself. Though evolution proceeds randomly, by trial-and-error (genetic variation and natural selection), it is ‘guided’ by the pre-existing possibilities.[[3]](#endnote-3)

Self-consciousness is a subset of conscious experience defined by being able to recognize oneself in a mirror. It must also be a pre-existing possibility because, besides finding it in humans, we also find at least the beginnings of it not only in other great apes and, convergently evolved, in some other mammals, for example dolphins, but also convergently evolved in corvids (Marzluff and Angel, 2013 pp. 191-98)⁠ and also, convergently again, in parrots (not closely related to corvids), even though the anatomy of an avian brain is quite different from that of a mammal⁠. An avian brain does not have a cerebral cortex.

**A wayward leap**

In the biological hierarchy of complexity each level constitutes a dramatic discovery. The new level is a pre-existing possibility, as discussed above, but it is not a logical derivative of the previous level, not a new iPhone that is more powerful than the previous iPhone. The new organization does not follow the path of the old but goes elsewhere. A mitochondrion in a eukaryotic cell, for example, has its own chromosome and ribosomes and began as a prokaryotic intracellular symbiont. Multicellularity in eukaryotes discovers the individual at a new level. An ant colony is based on eusocial interactions while earlier levels were based on chemical interactions. A therapy group is based on social interactions. An ecosystem discovers complexity on a geographic scale.

The above shows that, as a complex adaptive system evolves, it explores creatively, leaping in surprising directions to discover new (though pre-existing) opportunities for complexity (Holland 1992, p 20.) Rather than being theory, this statement is proven by observation of the current hierarchy of biological complexity. There is no reason, therefore, to expect that conscious experience is a logical derivative of neural organization: it is more likely that it reflects a wayward leap into a new kind of complexity.

With the above understanding of biological complexity, we can now discuss the emergence of conscious experience. Here we move from biology to psychology.

**Psychological components, story, and personality**

A psychotherapist might not agree that consciousness is the defining manifestation of human psychology. A psychotherapist works with the whole of a person’s psychology, understanding that consciousness includes different territory in different people: you may be more conscious of your thoughts and less conscious of your feelings, while another person may be the opposite. Also, consciousness changes as you mature. A psychotherapist might argue that your whole *personality* (including consciousness) better represents your psychology made manifest.

Carver and Scheier (2000) defined the personality as ‘a dynamic organization, inside the person, of *psychophysical* systems that create a person’s characteristic patterns of behavior, thoughts, and feelings.’ Psychoanalysts understand the personality to be a dynamic system of *psychological* components (Stolorow 1997, Beebe et al. 1997, Beebe & Lachmann 1998). Here I define ⁠ personality as a dynamic system of psychological components, for example feelings, thoughts, memories, images and ideals, both conscious and unconscious, both internal and interpersonal.[[4]](#endnote-4)

 Each psychological component is itself a dynamic system because it only exists while energy flows through it: a memory only exists while you recreate it; an image while you perceive it or imagine it; grief while you grieve; a thought while you think it. (A thought recorded is not a live thought but rather a record of a past happening that might happen again if another mind takes it up.) When several psychological components interact according to simple rules while the environment provides simple constraints, there emerges a higher-order dynamic system that is *story,* sometimes a verbal story but often a story composed of images: ‘I see you. Your face is familiar to me. It reminds me of your dancing.’ Like its psychological components, a story is transient because it does not happen in the pages of a book, only while it is being told. In turn, when stories interact according to simple rules while the environment provides simple constraints, there emerges the yet-higher-order complex adaptive system that is personality.

The transition from body-and-brain to a psychological component (feeling, thought, image, ideal) is a wayward leap from the material realm into a realm that is not material. Music provides an image for this transition. If the body-and-brain is like a piano being played then a thought or a feeling is ethereal, like a musical note.[[5]](#endnote-5) A thought or feeling is a dynamic system that requires a flow of energy but is not material. It is like a story or a play or a language (Beckner et. al. 2009) or philosophy or mathematics, all dynamic systems that have no mass. This transition from material to non-material dynamic system is central to my proposal about the hard problem.

The transition to the next level of complexity, story, is another leap but less surprising, rather a further development of psychological dynamic systems. In this transition, feeling, thought, image and ideal interact spontaneously with each other, not at the level of neurons but rather at the level of story. A novel, likewise, does not self-organize at the level of alphabet and ink but rather at the level of the author’s reverie.

While the above has been theoretical, in the next section I give concrete evidence for the transition from body-and-brain to one specific story.

**Evidence for the leap from body-and-brain to story**

I previously discussed this evidence in detail for one of the elemental transitions that begins personality development (McDowell 2010, pp. 15-25). I focus here on that transition because, since it occurs very early, it is relatively simple and clear. What follows is a summary.

1. Humans are the most social of animals and have evolved many physical attributes and behaviors to facilitate social interaction.

2. Psychoanalysts observe that personality emerges mostly through interactions with other people⁠, first in the infant-mother interaction.

3. The appearance of a primate’s eye has evolved towards a more vivid visual contrast between colored iris and white sclera, which contrast provides a better signal of gaze direction. In parallel with this change, the eye’s psychological function has evolved towards enabling *intersubjectivity* (humans’ ability to bond by sharing their subjectivity).

4. An undistracted nursing mother looks at her newborn 70% of the time and, during that time, the geometry peculiar to humanbreast feeding ensures that the mother’s and the newborn’s faces are about 10 inches apart, which happens to be the only distance at which a newborn’s eyes can focus. High-contrast, brightly colored edges (between iris and sclera) predominate in the visual appearance of the mother’s eyes while the newborn, not yet able to see whole images, preferentially focuses on and follows sharp moving edges, *especially moving edges that, like those in the mother’s eyes, follow the newborn’s movements*. Together, all these factors are biologically pre-set to ensure that a human newborn will focus on its mother’s eyes. This is not true for other animals.

5. Consequently, the human newborn-mother pair will establish, at about six weeks, a bond of conscious intersubjective eye-contact in which each communicates to the other ‘I know that you see me and I know that you know that I see you.’ Conscious intersubjective eye-contact excites and delights them both and further stimulates an array of joyful eye-and-face games. *What excites them both, and is the basis for their games, is their mutual realization that they share their consciousness of the other’s experience, that the baby knows that the mother knows that the baby sees the mother, and vice versa.* In popular language each ‘feels seen’ by the other. Feeling seen furthers personality development in part because it means you feel accepted when you express genuine feelings and thoughts. From these games (in conjunction with similar non-eye-contact games) emerges an enduring intersubjective bond between infant and mother. The forgoing ‘socially pleasant sensory experiences’ cause permanent changes in the infant’s oxytocin and vasopressin levels and the altered levels of these two hormones, in turn, enhance the child’s future bonding behavior, thus beginning a self-reinforcing cycle of relatedness.

6. Ideally, the mother is telling her infant (non-verbally) the following story⁠:

‘I see you with affection and delight; I understand you; I will feed you, sooth you, keep you safe, and frustrate you only to a degree that you can tolerate.’

The infant, meanwhile, is internalizing that story to create its own story, a dawning sense-of-self:

‘I am delightful, lovable, and secure; my aggression is not dangerous; I can express whatever I feel: you will understand me and will respond with affection and empathy.’

The two are beginning a warm, bonded *intersubjective experience that organizes itself through the stories they share with each other.* Of course, the infant-mother experience is often less than ideal and the infant may then begin to develop a more conflicted sense-of-self.

The above shows how simple biological factors not only support bonding between newborn and mother but also enable bonding stories to self-organize. The discontinuity between body-and-brain and story is large but the way in which the former enables the emergence of the latter is already known, at least for this example.

**Evidence that personality emerges from story**

There are several lines of evidence.

**1. Psychotherapy**

A psychotherapist works with stories. Psychotherapy is based, in part, on *active listening* (listening that is attentive, receptive, and thoughtful) to the patient’s story, coupled with responses that are sensitive to the patient’s context*,* that are supportive, and that seek to integrate this story with previous ones, or suggest new ways of looking at the story, or possible new outcomes. The therapist seeks to be conscious of the therapist’s own story and to see how it may intersect or collide with the patient’s story. Not only in therapy but also in daily life, the personality grows when its stories evolve.

**2. Our fascination with story**

Another line of evidence is our endless fascination with stories: camp-fire stories, horror stories, fairy stories, legends, myth, literature, song, poetry, theater, movies, gossip, reality TV, Tik-tok, twitter, facebook, you tube, instagram. Story telling is the central cultural activity of humans and always has been. No other animal does this. Story is more than entertainment: by engaging with it we cultivate personality. To relate to other people (and we are the most social of animals) is to share stories with them, either directly or by sharing activities.

If story is the stuff from which personality emerges then it makes sense that great literature is among the highest achievements of consciousness. The epics of Gilgamesh and Odysseus, the Bushman epic of !Ko-g!nung-tara (McDowell 2022, pp 127-188), the Melanesian story, *The Snake Mother* (McDowell 2022, pp 78-127), all these stories are vital because they make the wisdom of the unconscious available to the wider personality. In so doing, they help maintain the personality homeostatically (see below).

**3. Dreams**

Another line of evidence is experimental. Every dynamic system is homeostatic and a complex dynamic system must be homeostatic, *independently, at each level in its hierarchy*. This is necessarily true because, without homeostasis specific to one level, that level could not have stabilized in the first place. If one level’s specific system of homeostasis fails, then that level disintegrates. For example, your organization at the level of body-and-brain cannot exist without your lungs, kidneys, pancreas, other glands, and temperature regulation systems that cooperate to maintain an internal steady state. From the above we can predict that, if the personality is a dynamic system *at the level of story*, then it will include homeostatic systems that operate specifically *through story.*

A dream is a story that emerges directly from the personality without interference from conscious prejudices. Elsewhere co-workers and I have presented experimental evidence that a dream compensates homeostatically for a personality’s one-sidedness (McDowell et al. 2023). One dream showed that a man who projected his vulnerability onto others needed to accept it in himself and return to his own creative work. Another dream showed that a young man’s personality was overly influenced by his father’s unconscious injuries. Another showed that a young man who had treated a female friend badly needed to resolve this with her, though he dreaded to face his own behavior. One showed that a young woman who was non-binary needed to come out. A woman who had been bullied by men needed to embrace her own phallic potential to better defend her boundaries. A woman who had been raped as a child but had never spoken of it needed to speak of her abuse in order to become more assertive. A man dominated by obsessive thoughts needed to transform his obsessive behavior. A woman who tended to be controlling needed to embrace her own cat-like self who was free to do what she wanted. Each of these dreams is evidence that a dream helps to maintain the personality by homeostasis at the level of story.

4. **Visual art**

Elsewhere I have presented evidence that the most serious visual art embodies a structural ‘story’ that also functions homeostatically to develop and maintain the personality (McDowell 2006).

The above four lines of evidence are independent of each other, but they each support the same argument, that personality emerges from, and is guided by, story.

**Evidence that story creates conscious experience**

I attended the same university as my brother who was two years older. We did not run into each other very often but, on one occasion as I walked along a path toward a glass door, I saw that he was approaching the same door from the inside. We both reached for the door but, when I pulled the door open, I saw that the passage was empty. I had mistaken my own reflection. Though I had the conscious experience of being about to meet my brother, my experience was not of the outside world. My experience was the story I was telling myself.

 One reason that a play or a movie, or indeed any story, appeals to you is that, for a couple of hours, you are liberated from the story that usually plays in your mind. You are plunged instead into experiencing the story of the actors, or perhaps the story of the scriptwriter or director or, more accurately, into the story of the world these people have chosen to depict. The experience conveyed by the movie displaces your everyday experience. Your *everyday experience,* therefore, is the story you are presently telling yourself, the movie you currently see unfolding before you, whether factually accurate or full of creative license. You have a big role in that story and watching the movie is ‘what it is like’ for you to have conscious experience.

To tell a story is to re-experience it. Not to tell it is to avoid experiencing it. To experience something in the first place is to tell yourself a story about it. If you don’t tell yourself the story then what happens is a meaningless blur of sensations, perhaps intense but not fully experienced.

You can perform and action without experiencing it consciously. If you leisurely ride a bicycle along a familiar, uncrowded route while preoccupied with other thoughts, you may find that you cannot remember the part of the route you have just completed because you did not *consciously experience* it. Your ‘mind was elsewhere,’ you were on ‘automatic pilot.’ You were not riding dangerously because you were alert, listening, watching, and sensing the surface without being conscious. Had anything required conscious attention, you would have become conscious of it. You did not experience the ride because you were not telling yourself the stream-of-consciousness story of it: “here I can see the river again; here the slope inclines but I don’t need to change gear, I can push harder; this runner is veering out to pass another, I’ll coast until he gets back in lane; now I’m in shade from these buildings; now the route veers east and the wind is behind me, I can change up a gear;” and so on.

To experience a person is to notice that the person is particular, neither that, nor that, but *this,* to notice what is special about the person, that is, to tell yourself a story about the person. Without the story, you don’t notice or experience the person. From the beginning of their life together, infant and mother experience each other intersubjectively (see above) by telling each other non-verbal stories of how they see each other.

An important part of psychotherapy (if you are not fully in touch with your feelings and many are not) is to help you to recognize what you are feeling, to help you experience it. Perhaps, if the feeling is anger, by walking, or kicking, or cursing and perhaps, if the feeling underneath the anger is hurt, by then reaching the hurt and experiencing that, and then grieving that you have been hurt so much and admitting that you were so vulnerable, so able to be hurt. All of this you can only experience as you admit to yourself the story: What was done to you? By whom? How did you feel then? How would you feel if you saw that being done to your friend? What new feeling is coming up now? The answer to all these questions is more story.

You do not fully experience an emotion until you have learned to identify it consciously, to name it. You may be angry and display it enough for others to see it but, at the same time, if you cannot yourself identify the anger and talk about it, that is, tell yourself a story about it, you will be unable to let it ‘run through your veins and out of your fingertips.’ When you hear a scary story ‘your blood runs cold.’

Destructive stories from your childhood, stories of abuse, exploitation, betrayal or threat, for example, or stories from adult trauma, can be confined to your unconscious where they negatively affect your conscious experience but cannot be softened or transformed by adult understanding. Your therapist’s work, in part, is to help you to bring these stories into conscious experience. When you can hear them, share them, have them accepted and understood and perhaps reinterpreted, then, because they have become conscious experience, their destructive influence can be transformed.

Dissociation is a relatively primitive and therefor inaccessible defense in which you have no access to memories of a past event, or no access to important feelings. The foregoing indicates that what has dissociated is your story.

How you experience a setting depends on the story you are telling yourself about it (the story you are listening to). If you are on the beach because it is part of a much-desired vacation then your story may be of pleasure. If you are a migrant on the beach in Libya and you have no way to travel to Europe then your story may be of longing or frustration or despair.

The story need not be verbal. When you play with a dog by throwing a ball, part of the game is to tease the dog several times before you throw. You are telling two stories: ‘I am about to throw it,’ and, ‘I’m teasing you; I won’t throw it yet.’ The dog reads both stories and sends the following story back ‘I’m ready, I’m ready, throw it already!’ The dog experiences that you are preparing to throw, or teasing it, only because you are telling it both those stories and you experience the dog’s readiness only because it is telling you that story.

Your story intrinsically manifests your subjectivity, perhaps by describing it explicitly or in metaphor or perhaps by your choice of objective subject. If you choose to talk to me about a baseball player and a baseball game, that tells me something about your inner world.

Here is a story told by a two-year old boy (Sutton-Smith 1978):

*The monkeys
They went up sky
They fall down
Choo-choo train in the sky
The train fall down in the sky
I fell down in the sky
I got on my boat and my legs hurt
Daddy fall down in the sky.*

His story allows us to experience his inner life. Perhaps, as is characteristic of the ‘terrible twos’, his illusion of omnipotence is breaking down: ‘Mischief leads to a fall [from grandiosity]. I fall. It rocks me and hurts my pride. Even my dad, who is like a dragon or thunder god, falls.’

From the above evidence, it seems that *to have conscious experience may be to tell yourself (show) and listen to (watch) a story that conveys it*. Conscious experience may not be the hard problem. Perhaps the hard problem was to understand the leap in self-organization from brain-and-body to story.

In sum, an emergent hierarchy of layers of complex dynamic systems begins with small molecules, passes through biology, then through psychological components and story to personality. While neuroscience may explain conscious functions reductively in terms of the brain’s neural mechanisms, conscious experience may arise from a level of organization higher than brain, the complex dynamic system that is story. Both a dream and serious work of literature oppose grandiosity (a destructive psychological distortion) because one of their functions is to compensate for excess, that is to maintain the personality homeostatically.

**What is conscious experience for?**

Chalmers argues that a person could in theory be a zombie that functions like a human but has no inner life, that it is not obvious why we need an inner life. Nevertheless, conscious experience, the subjective awareness that an experience is being had while it is being had, seems to be shared with many different animals.

Just as all mammals and birds probably have conscious experience, so it seems that almost all mammals and at least some birds also dream (Pena-Guzman 2023 pp.15-60). If conscious experience is the story you are telling yourself while you are awake and a dream is a story that emerges from your sleeping brain, then they both may have the same function, the homeostasis of personality. Throughout evolution, both dreams and conscious experience may have conferred this selective advantage.

Personality is an extraordinarily complex adaptive system that, as I have shown above, cannot be specified by genes. Beyond the help you may get from parenting and education, you must develop for yourself your own personality, just as a swift, held aloft in the wind and preparing for the first time to fly, must transform its personality to become a creature of the air: when it takes flight it will remain aloft, day and night, for several years (Macdonald 2020, pp 136, 138-9, 229-230). Hence, for humans, the value of adolescence and going away to college. Hence your need for play, sports, work, ethics, religion, art, reading, intimacy and continually talking with others. How well your personality functions determines how well you do everything else in your life, which means that developing your personality is the most important thing you ever do. If conscious experience provides homeostasis for the development and maintenance of personality then it makes sense that you devote a significant proportion of your metabolic energy to generating conscious experience. Self-consciousness in particular allows you to observe your personality and make mid-course corrections if you wish. When you are tempted by envy, avarice, grandiosity, addiction and so forth, self-consciousness may protect you. At the entrance to the Temple of Apollo at Delphi, at least as early as the 5th Century BC, were inscribed the words “Know thyself” and “Nothing in excess.”

**Chimera**

In myth, beings composed of two different animals are ubiquitous. The earliest known, cave paintings from Indonesia and an ivory carving from a cave in Germany that has the body of a human and head of a cave lion (Cook 2017), were created about 40,000 years ago. Depictions of chimeras seem to represent a very old intuition about the human condition.

Biologists define life with a list of criteria: a living organism is a complex adaptive system that reacts and adapts, uses energy, grows, is composed of unicellular or multicellular units (except for fungi), reproduces, and can evolve. The personality fulfills all these criteria: it reacts and adapts to its environment, reproduces some of itself in the next generation, and grows; it absorbs psychological energy (love, play, challenge), expresses psychological energy (anger, excitement, love, creativity) and it evolves. For the personality a person is the unit and mental memory substitutes for chromosomal memory.

It follows that the personality is a psychologically based form of life, while the brain-and-body is a chemically based form of life. These two life forms are radically different: one has mass and the other does not. If we find chemically based life on another planet, it will be more like your own body-and-brain than is your own personality.

In a lichen three organisms, a fungus, an algae, and a yeast, live together symbiotically, the three, though intimately entangled and completely dependent upon each other, being of entirely different species. A person seems to be similar, a chimera of two radically different life forms that cooperate intimately and depend entirely upon each other. Part of the work of psychotherapy is to enable these two life forms to relate successfully to each other. A person is part body-and-brain and part personality, an interactionist duality.

**Endnotes**

1. No three-dimensional form is genetically inherited. A gene is a linear sequence of four small molecules (called *bases*: A, T, G and C), which, when strung together one-by-one like beads on a necklace, become a long strand of DNA. When the body needs that gene to function, its DNA *base sequence* is translated into a corresponding *amino-acid* *sequence*; that is, a linear array composed of twenty-one different small molecules (amino acids) also strung together like beads on a necklace. The DNA base sequence, when grouped into triplets of three bases, exactly specifies the amino-acid sequence. If, by random chance, a substitution occurs at a single point in the DNA sequence (for example triplet AAA changes to GAA), then this *mutation* codes for a single substitution in the corresponding amino-acid sequence. A single amino-acid substitution, in turn, may change the properties of the completed amino-acid strand. [↑](#endnote-ref-1)
2. An amino-acid strand is, on average, about 400 units long, though the length varies from about 50 to 33,423 for an outlier sequence that gives muscle its spring. A form emerges only as the amino-acid strand grows longer and, at the same time, spontaneously folds into a specific, tight, three-dimensional structure called a protein. This spontaneous folding is an example of self-organization. The amino-acid sequence is linear, while the final folded structure is subtle and complex.

An amino acid is a small molecule made up of an invariant part, by which each amino acid bonds to the next, and a short side-chain of atoms, which is different in each of the twenty-one amino acids. A side-chain is either *hydrophilic* (attracted to water, as salt is) or *hydrophobic* (repulsed by water, like oil). The exact form into which a sequence of amino acids folds is a consequence of the different chemical elements (atoms) in the side-chains, the different sizes of the side-chains, and whether the side chains are hydrophilic or hydrophobic, which latter determines the force between each side-chain and the water that surrounds the protein (more accurately, the protein is surrounded by a dilute salt solution whose salinity, acidity, and temperature are critical). The protein spontaneously folds to ensure that each hydrophilic side chain is exposed to water, while each hydrophobic side-chain is folded inside, away from the water.

This creates myriad opportunities for complexity because a single mutation in the DNA may replace a hydrophilic amino acid with one that is hydrophobic, or vice-versa. One such replacement may dramatically change the folding, creating a new protein with quite different properties that can evolve to serve a completely different function. But, while the sequence of amino acids *enables* an invariant folded form to emerge, the sequence is not a blueprint for this folding: the folding emerges by self-organization. A mutation, likewise, does not code for a new form but only *enables* a new path for self-organization. [↑](#endnote-ref-2)
3. Carl Jung saw the importance of pre-existing possibility, which he termed *archetype* (McDowell 2001; McDowell 2022 pp 9-20). Because his concept of evolution was Lamarckian rather than Darwinian, and because the complexity paradigm was not available to him, Jung could not explain an archetype scientifically. [↑](#endnote-ref-3)
4. My inclusive definition is compatible with most theories of personality, for example with trait, type, psychoanalytic, behaviorist, social cognitive, and humanistic theories. It also recognizes that psychological life is in large part interpersonal, that is, residing in the exchange between people as they relate to each other. [↑](#endnote-ref-4)
5. The analogy is not exact because a musical tone is still a vibration of matter, though the medium *seems* ethereal.

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