

Chapter Four

How Mind and Body Interact

One of the main problems discussed in philosophy of mind is the relation between mind and body, and how mind interacts with body. This is the mind-body problem, and there are a wide variety of positions on it. According to materialists, mind is a physical thing, and mind is either identified with the brain, or can be accounted for in terms of the brain. Behaviorists hold that mind can be accounted for in terms of behavior. This position was discussed in chapter three. Dualists, following Descartes, hold that mind is distinct from body, and cannot be accounted for solely in terms of brain functioning or behavior.

When philosophers write about the mind-body problem, they sometimes attempt to refute Cartesian dualism by arguing that, if dualism is true, then interaction between mind and body is impossible. How is it possible, they ask, for a mental state, which is an immaterial object, to interact with a material or physical body? Where is the locus of interaction? If Descartes is right that the mind is a private, subjective, immaterial object, then it is impossible to account for the fact that our mind influences and interacts with our body. Mind and body cannot interact because an immaterial thing cannot influence or modify a material thing such as the human body or brain.

This “refutation” of Cartesian dualism rests on an overly simplistic view of the nature of mind and brain. Descartes is in fact partly at fault here, however, because it is Descartes who defined mind and body as being fundamentally incompatible. According to Descartes, our mind is fundamentally an immaterial thing, while our body is fundamentally a material thing. In a sense, then, Descartes has set himself up for the refutation of his own philosophy by materialists.

On the other hand, materialists themselves are to blame for accepting an overly simplified view of the nature of mind and body. Once we accept Cartesian dualism as an accurate statement of the nature of mind and body, we have already set ourselves up for an impossible dilemma. Given the Cartesian conceptions of mind as immaterial substance that does not take up space and the accompanying Cartesian conception of body as material substance that takes up space, it is indeed difficult and perhaps impossible to explain how mind and body interact.

This chapter discusses how to account for mind-body interaction within a dualistic framework. It presents revised definitions of body and mind that makes it possible to account for mind-body interaction. It discusses the nature of the self, and discusses the relation between self, mind, and body. The chapter then discusses a way of understanding how mind and body interact. Finally, it presents a model of the person that includes soul and spirit, and discusses the nature of soul and spirit.

A New Perspective on the Mind-Body Problem

One reason the mind-body problem is difficult to solve within a dualistic framework is because of the definitions of ‘body’ and ‘mind’ that are used in stating the problem. These definitions need to be reformulated so that is not an unsolvable problem. We need to take a new look at the definitions involved, and see if they can be restated in such a way that the mind-body problem can be solved. Once this is done, we can then take a new look at the problem to see how mind-body interaction can be accounted for.

What is a Body?

One of the fundamental difficulties with the way Descartes set up the mind-body problem is that he divided everything in the universe into two fundamental categories: mind and body. Even though he recognized the existence of the self, or subject of experience, he sometimes identified this self with mind and other times spoke as if it is something distinct. But Descartes’ dualism does not readily allow us to treat the self as different from the mind. If there are fundamentally two kinds of things in the universe, mind and

body, then self must somehow be identified with one or the other. And since Descartes was not a materialist (materialists identify mind with body), the only choice is to identify self with mind.

Descartes' view is overly simplistic in another way: he treats "body" as a single category. Descartes talks as if an inanimate physical object, such as a rock or a glass, is the same type of entity as a human body. His view derives from his definition of body as "that which takes up space." It is true that both inanimate objects such as rocks and human bodies take up space. But a human (or animal) body is also a complex organic structure that has life and is somehow associated with conscious experience. This organic structure is of fundamental importance in understanding how it is that experience arises, since it is the human body that contains sense organs and the capability of processing the information from them in such a way as to make experience possible.

Because there are two different concepts of "body," when philosophers ask the question "What is the relation between mind and body?" they are really asking two separate questions:

1. What is the relation between a human mind and physical objects?
2. What is the relation between a human mind and the human body associated with that mind?

The answer to the first question is that there is no single relation that characterizes human minds and physical objects. But certainly physical objects serve as an object of perception, and they send physical light and sometimes sound waves to our minds for processing. There are some experiments that suggest that our minds can act directly on physical objects, as when people claim to be able to move forks and other inanimate objects by concentrating, but these experiments are far from established. And this is not the question that philosophers are most interested in when they ask about mind-body interaction.

It is the second question, the relation between mind and the human body, that has perplexed philosophers for so many centuries. Because of what we know now about how our brains work, the question is usually phrased in terms of the relation between a human mind and the brain associated with that mind. Alternatively, the question is phrased as one about the relation between a particular mental state and the brain state associated with that mental state.

Once we have distinguished two concepts of body, body-as-inanimate-object and body-as-organic-structure, the nature of the question changes. For now we are not asking specifically about the relation between mind and an inanimate object that exists outside our mind and simply takes up space. Instead, we are asking about the relation between our minds and the organic structure containing sense organs that is associated with that mind.

The human body is quite complex. It is true that it shares with inanimate objects the physical property of taking up space. But a human body is a biological system that serves as the basis of human life. A human body is a biological system in which all the components must work together for life to be supported. The heart, kidney, liver, and brain must all function properly or the organism will either die or suffer from disease. The human body also contains a system of sense organs that systematically feed information to the brain about the environment. These sense organs are fundamental to our survival, since if we could not see or hear what is in our immediate environment, we would not survive very long.

Once we make the distinction between two concepts of body, the problem of explaining mind-body interaction takes on a different character. One usual way of criticizing the Cartesian view that mind and body can interact is to say, “How can a mind, which does not take up space, possibly interact with a physical body that takes up space? Where is the point of interaction between a physical body in space and an immaterial mind?” This question does make some sense if we understand the body as an inanimate object. But

even here we can say “The object sends out light and sound waves that the mind can interpret through its sense organs.” So the sense organs provide some possibility of interaction between our minds and the physical world. Our eyes and ears have a physical aspect, but they are also hard-wired to provide input to the brain.

Asking the question about mind-body interaction and interpreting the question as one about the human body or brain makes the question quite different, however. Obviously a human mind has a very close relationship with its associated brain. The brain is constantly processing input from sense organs and also sending signals to those sense organs to do certain things like focus on different aspects of the environment. The human body is an intelligent system whose proper functioning is essential to our survival. So however this complex system interacts with the mind, it involves much more than simply finding a locus of interaction between an immaterial object and a physical object that takes up space.

What is Mind?

Even though Descartes had an overly simplified view of the nature of mind and body, he did have an interesting way of defining these terms. Descartes had a single-attribute view of mind and body. What this means is that he defined both mind and body in terms of having a single attribute. The single attribute he defined body as having is “taking up physical space.” The single attribute of mind is consciousness or awareness.

This single-attribute approach is a useful one to take. In fact, we can accept Descartes’ definition of mind as “power of consciousness or awareness.” This coincides with the close connection we observe between mind and brain, since consciousness and awareness both seem to be centered in the brain. The term ‘awareness’ is slightly broader than ‘consciousness.’ Our mind then becomes most closely associated with our thoughts, which seem to occur “in the mind” and also somehow “in our head.” In fact thoughts, unlike feelings, seem to be centered in the brain, and we somehow experience them as being localized inside our head.

The writings of Sigmund Freud have also popularized the notion that somehow our minds contain an unconscious element. There is no reason to doubt these psychological findings, and I believe that a Cartesian concept of mind can include the unconscious. One way to understand the unconscious is to say that certain neural correlates of thoughts and experiences are stored in the brain. Because they are stored there, they have the power to influence our behavior. They also may become conscious when we focus on them. So the existence of an unconscious mind does not refute Descartes' definition, and can be accommodated within it.

The term 'mind' is also ambiguous. In one sense, the term 'mind' refers to the entire structure that is responsible for creating mental representations. In this sense, the term 'mind' means "power of consciousness or awareness." When we use the term 'mind' in this way, we are talking about the underlying structure that creates our perceptions. Used in this sense, the mind is parallel to the brain, or to the entire sensory system.

In another sense, the term 'mind' refers to the contents of our experience. We sometimes talk about what is "in the mind." What is in the mind is the contents of our experience. For example, if I am seeing a tree, then my perception, which is also the experience of seeing a tree, is in my mind. If I am thinking about a project at work, then my thoughts are in my mind. The term 'mind' refers to the representations our mind forms, and these representations are said to be "in the mind." The contents of our mind are parallel to a brain state, or to the state of a sensory system.

Mind as the Contents of Our Experience

To better understand the concept of mind as the contents of our experience, we can ask where these experiences occur? For example, where do thoughts occur? Are they literally in our heads? They are not literally inside our heads, if that means they take up space, as does the brain. Leibniz has observed that if you open up someone's head, you will not see thoughts. (He does not report if he actually tried this experiment.) What we do see when we look inside someone's head is either a lot of "gray matter," or if we look

at a deeper level, a lot of neural activity and signal transmission. The existence of magnetic resonance imaging (MRI) has enabled scientists to look at other aspects of the brain. Computer axial tomography (CAT) scans also make it possible to look at a fairly broad level for abnormalities in the brain.

Whatever thoughts are, or wherever they occur, it seems clear that they have a physical aspect. Thoughts originate in the brain, and without the brain, we would have no thoughts. This means that thoughts have a physical or neural component. It does not mean that there is a unique neural component for each thought, or that thoughts are literally in the brain. It does mean that the materialists are partially right, since the neural component of a thought is part of the thought, not just a physical aspect that is somehow associated with the thought.

One problem when trying to understand the question “Where do thoughts occur?” is that we naturally tend to impose a physical framework on our search for the answer to this question. Because we somehow experience thoughts as occurring inside our head, it is natural to look inside our head for the answer to this question. And when we look inside our head, we naturally think of our brain, since it is our brain that is literally inside our head. But we will not find thoughts inside our brain.

Consider a similar example. It is fairly common for people to experience for people to experience spots in front of their eyes. A speck on the eye surface that casts a shadow on the retina typically causes these. Because our eyes create a visual representation of what appears on the retina and project this representation onto the world, this shadow gets projected into space as if it is a black spot in space. Yet we know in looking at it that this spot is not really in physical space, it is merely a mental representation of a spot that is caused by a speck on the surface of the eye.

This example shows the creative power of the mind. When we perceive an object, what we really perceive is a representation of the object that our mind creates, based on information we receive from the object. If our representation is accurate, then we are

really seeing that object. But if our representation is inaccurate, then we are experiencing some kind of illusion or mistaken perception.

The philosopher Berkeley was famous for his view called idealism, according to which the entire world is mental and what we perceive to be physical objects are really just mental constructs. The above analysis is not a form of idealism, however, since there is still a physical object out there to serve as a source of light and sound waves and other sensory data. The physical object exists independently of our minds, and it does not cease to exist when we are not looking at it. So even though the above analysis shows that we perceive objects by constructing mental representations of them, it still allows these objects to exist independent of our minds.

What the above analysis does show is how dependent on the nature of our own minds the world we perceive is. If our minds construct representations of physical objects based on information from them, then the type of representations our minds construct will be very dependent on the type of mind we have. This explains why animals perceive the world differently from us. They have very different types of minds, and some have completely different senses from human beings. So the representations that animals create will be very different from our own. They quite literally see the world differently. They may be seeing the same world as we are, but it looks very different to them.

If we ever encounter aliens from outer space that have minds, chances are that the world looks very different to them than it does to us. Perhaps they can perceive an aura of color around living beings, or possibly they can determine what emotions people have by perceiving emotional signals they emit. Perhaps they can see light in many areas of the spectrum that we cannot, or hear high-pitched sounds that are inaudible to us. The possibilities are virtually unlimited.

How do we know if these alien beings have minds at all? They have minds if they construct representations of the world that only they are aware of based on input from the world. This analysis fits in well with Descartes' definition of mind as the power of

consciousness or awareness. What we do when we are conscious of an object is to create a private representation of it based on input from the object. The qualification “based on input from the object” is important because consciousness is a form of knowledge and if the representation is not based on input from the object, or is simply an imaginary construct, then it is not a case of consciousness of the object.

Is our view of the world any better or more accurate than that of a bird, a squirrel, or a cat? The knowledge that an organism has of the world is relative to the type of organism. Each type of organism selects out different aspects of the world to experience, based on its particular set of senses. Honeybees, for example, have a very keen sense of distance and location. Cats can see in the dark. Bats use a kind of sonar for judging distances. Each organism sees the world from its own point of view. Our point of view is “correct” for human beings, but it is not necessarily superior to that of animals. The only sense in which our point of view may be “better” than that of animals is that we have more senses than some, and we have superior processing powers to the animals. But even on this criterion, some animals have senses we don’t have, and the processing power of some animals may be better than ours for certain senses. Still, there is only one world, but there are many ways of perceiving it.

The Role of Sensor Organs in Creating Mental Representations

Given that our minds construct representations of the world, what is the nature of these representations and where are they located? Many of our mental representations are a result of the action of our sense receptors. In fact, sensors play a fundamental role in enabling us to experience the world. Our eyes are visual sensors, and our ears are auditory sensors. But are these sensors, or sense organs, mental or physical in nature?

Obviously, our sense organs have a physical aspect, since they take up space and can be perceived just as other physical objects are. Of course, we can only see our own eyes by looking in a mirror or other reflective object, but we can see the eyes of other people. On the other hand, they might seem to have a mental aspect in that they process information

according to strict rules and convert this information into a form our brains can understand.

To understand better the relation between mind and body, let us consider the human eye. Human eyes normally work in pairs, and their function is defined by the mental act of seeing. Seeing is a mental power or faculty. It is one of the powers of the mind. So the mental power of seeing defines the function of the eye. The eye is an organ of sight. This is one relation between mind and body. Mind in the sense of the mental power of sight defines the function of a bodily organ, the eye.

Other bodily organs display a similar relation to a corresponding mental power. The function of the ear is hearing. So the mental power of hearing defines the function of the ear. The ear is structured so as to make hearing possible. The reason the ear is large is to capture sound waves. The fluid in the inner ear acts as a transducer, converting sound waves to a series of neural impulses by setting the roots of the cilia in motion. Just as having two eyes makes the perception of depth possible, the organism uses the input from both ears to judge distance. The function of the ear is defined by the mental power of hearing, and the structure of the ear can be understood in terms of how it contributes to this function.

The nose displays a similar relation to the power of smelling that the ear does to hearing and the eyes do to sight. The function of the nose is for hearing, and its structure can be understood in terms of how the components of the nose contribute to this mental power. Taste is similar, although there is a less clearly identifiable organ in the case of taste. Since our taste buds are on the tongue, the tongue can be viewed as the organ of taste, although it serves other functions as well.

Touch is similar to taste, except that its touch sensors are spread out over our entire body. Our skin is perhaps the closest thing to an organ of touch. The touch receptors are much more heavily localized in certain critical portions of the body, such as the fingers

and face. Obviously, our skin serves other functions besides serving as an organ of touch.

The brain is an organ of knowledge and experience. This should really be extended to the entire body because even though the brain is inside the head, the sensory structure to which it is attached is spread throughout the body. A better way to describe this is to talk about our “sensory system.” The purpose of our sensory system is to enable us to acquire knowledge and experience of the world.

If we look at the mind as a whole, in terms of the power of consciousness or awareness, then mind bears a similar relation to brain or sensory system that the power of perception does to the eye. The function of the brain or sensory system is defined in terms of the mental power of the mind. In reality, the brain serves as a processing center for input from the sense organs, while we either experience our mental perceptions in our sense organs or they are projected out into the world.

I believe that the tendency of many philosophers who discuss this topic to focus so exclusively on “the brain” derives from a tendency to make generalizations and from their not actually examining how the brain and our sensory systems work. While we experience thoughts as occurring in our head or brain, most mental perceptions are not experienced there. Instead, the brain serves as a processing area for input from the various senses, and also functions to project our mental representations into the world.

One interesting aspect of the above discussion is that each of our sense organs is defined by its mental function. This shows that it is a mistake to think of “the body” or “the brain” as a purely physical thing. Instead, each sense organ has a mental component, and this component has to do with its very definition. If our sense organs and our body are defined in terms of their mental function, then they have a dual aspect. Rather than being purely physical, they are partly physical and partly mental.

Parallels Between Electronic and Biological Sensors

In Chapter Three, we looked at the nature of physical and electronic sensors, and discussed how they sense and represent some physical state such as temperature or flowrate. One important fact about sensors is that, when a sensor exists, it is usually because some quality or property of the sensor varies in a regular and predictable way with the quality or property that is being sensed. In a mercury thermometer, for example, the height of the mercury in the tube varies in a predictable and regular way with the temperature.

Temperature is measured in industrial environments through a variety of means. One that most people are familiar with is the liquid-in-glass thermometer. As nearly everyone knows, the height of a column of mercury in a vacuum tube is directly proportional to the temperature of the air or liquid surrounding the tube. Liquid-in-glass thermometers are very common in home and office, but they normally must be read manually and usually do not give off a signal.

The most common type of temperature sensor in industrial environments today is the thermocouple. A thermocouple consists of two wires of different metal composition that are connected together at both ends. When the two ends of a thermocouple are at different temperatures, a voltage is generated in the wires that is proportional to the temperature at one end of the wires where the two wires are connected. While this change is not linear, it is nonetheless predictable. By reading this voltage, it is possible to determine the temperature at the point where the two wires are connected.

Let us now compare how it is that we sense heat. We have temperature sensors all over our bodies that sense different degrees of hot and cold. When our fingers approach a flame, we can feel the heat from the flame on our skin. We feel this heat because the heat itself is acting directly on our heat sensors, causing them to generate an impulse to the brain that says “Heat here!” This has an obvious purpose since if we couldn’t feel heat, our fingers could be badly burned very quickly. Just as the presence of a temperature difference causes a voltage to be generated in a thermocouple, so the presence of heat causes our heat sensors to send a “Heat here!” signal to our brain. The brain then has the

job of communicating this message to the executive branch, where decisions are made. Once the signal has penetrated our awareness, we can then choose to withdraw our fingers, if that is what we want to do. The signal generated by our heat sensors occurs every time heat is present, provided our sensors are working normally, and is very predictable.

Obviously, the role of transducers and transmitters is of fundamental importance in enabling the sensor to provide useful information. Suppose a controller is monitoring and controlling the heat of the liquid in a tank, trying to keep it at a setpoint (desired value) of 120 degrees. The controller receives feedback from a thermocouple that monitors the temperature of the liquid in the tank. It then compares this value to the setpoint and takes some kind of action, either raising or lowering the heat that controls the temperature of the liquid in the tank. This can be done by sending a “More heat!” or “Less heat!” signal to a heater. Of course, the controller may take no action, if the temperature in the tank is at setpoint.

If the signal from the thermocouple is not strong enough to be transmitted to the controller, the thermocouple will not be able to do its job of sensing the temperature of the liquid in the tank. At the same time, if the output signal from the thermocouple does not match the input signal to the controller, the controller will be unable to read the thermocouple signal. In many industrial contexts, the controller is looking for a 4-20 mA signal, while the output from the thermocouple is a very small millivoltage signal. A temperature transmitter is required to convert this signal into a form the controller can understand and transmit the converted signal to the controller.

Again, the response is predictable. The same light pattern yields the same retinal impulse pattern every time, if our eyes are working normally. This impulse pattern is then passed along to the higher processing area of the brain, and eventually is analyzed in the visual cortex. By utilizing a map of the visual field, the visual cortex generates a representation of the object that we experience as being located roughly where the signals from the object originated.

If we look at vision, we find a very similar story. The light-sensitive nerve cells on the retina correspond to physical sensors. The presence of light waves from an object generates a predictable pattern of impulses on the retina. This pattern of impulses need not actually resemble the object, but it does represent the object. Just as the voltage output from a thermocouple varies in a predictable way with variations in temperature, so the output from the light sensitive cells in the retina vary in a predictable way with different patterns of light and darkness that these cells are exposed to.

Retinal signals pass through several layers of visual receptors before the pattern they contain is passed on to the visual cortex for processing. High-level cells within the eye that convert these light patterns into a form the brain can understand correspond to a transducer, or transmitter, that converts the sensory input into a form a controller or distributed control system can understand. The role of a transmitter is to both transduce and amplify the signal so that it can be transmitted over a distance without losing its integrity. Transducing the signal involves converting it from one form to another according to strict rules so that no information is lost. The amplification is necessary because the signals put out by many sensors such as thermocouples are so small that they could not be transmitted over distance without being corrupted.

In the case of hearing, the eardrum is the physical sensor. Vibration of the eardrum sets up a series of events in which the signal contained in this vibration is transduced or converted into a form the brain can understand. As the sound waves impact the liquid in the ear canal, the signal is set up by the pattern of the roots of the cilia (very tiny hairs) that exist in the inner ear. these cilia send out a pattern of impulses that the auditory cortex can process. This pattern of impulses contains a map of the sound-event.

How is it that we come to have the experience of seeing the object? The key to answering this question lies in understanding the concept of point of view. For even though our minds create a visual representation of an object, if “our mind is elsewhere” we may not experience this representation. If your mind is on your latest project at work,

or you are listening to your favorite song, you may be oblivious to the beautiful tree right in front of you that your eyes are creating a representation of. What we are experiencing at any given time depends entirely on what we are focused on. And another way to say this is to say that it depends the point of view we take.

Where does this leave us with respect to the mind-body problem? The problem of mind-body interaction can be formulated as the problem of explaining how the processing of visual and auditory information gives rise to the private, subjective experience of seeing or hearing an object. But notice that the problem is now reformulated in a way that avoids the overly simplistic Cartesian dichotomy of mind and body. Sensors display some physical aspects and some mental aspects as well. They take up space, but they are also biological structures that operate according to strict rules. And the output of our eyes and ears, once it is transduced and modified, serves as input to the brain.

Having said this, we still have to explain how the neural pattern that originates in the outside world, when it appears within the brain, results in the private, subjective experience of seeing or hearing an object. This is still a difficult issue, but it may be less difficult now that we understand better the nature of sensors that mediate our experience.

What is a Feeling?

What happens when we our fingers approach a flame and our heat sensors begin sending signals to the brain? If we attend to this situation, we experience a feeling of heat in our fingers. Why in our fingers? The brain locates the feeling at the point it originates, just as our eyes locate the visual representation of an object at the point where the light waves from the object originate. We may describe this as “a sharp, burning sensation.” It is a feeling of heat. But then what is a feeling?

It is interesting to note that the word ‘feeling’ can be both a noun and a verb. To feel something is to actively come in contact with it to determine its texture, softness, pliability, etc. Notice that we can’t normally tell the color of something by feeling it.

But there is a series of qualities we can determine about an object by rubbing our fingers or hands over it.

A feeling is the subjective impression we get when we feel something. This subjective impression is just as predictable as the signals generated by the heat sensors when our hand approaches a flame. It is a representation of the heat that is impinging on the sense organs in our fingers.

How does our mind create these representations? And what is the relation between what is going on in the brain and the resulting mental representations? To answer these questions, we need to better understand the nature of experience.

How Experience Arises

Once we tell the story of the sensors, we still need to explain how it is that conscious, subjective experience arises. How does the private, subjective experience of seeing a tree arise from the act of sensing the tree by detecting and processing the pattern of light waves deflected by the tree? Unlocking the answer to this question contains the key to solving the problem of mind-body interaction.

One important thing to understand when analyzing this question is that when we move from “My eyes are processing visual information about a tree” to “I see a tree,” we are switching the subject from our eyes to our self. The subject who sees the tree is the person or self, it is not the eyes. The person or self simply uses his eyes to see the tree. This brings us back to the subject-object distinction, in which a conscious subject is seen as perceiving information from external objects. As we have seen, this perception occurs by means of our senses. Somehow we take in information from the world through our senses and process it, and as a result we have experiences.

Let us suppose that someone is looking at a tree. A tree-like visual pattern passes through both eyes, and both patterns converge on the retina. This tree-like pattern, which may not actually resemble the tree but nonetheless represents it, is processed beyond the

retina and a signal is sent in the form of a certain neural pattern to the visual cortex. This is what is happening at the physiological level. The subject reports, “I am seeing a tree.” What is the relation between the physiological process and the experience of seeing a tree, an experience the subject has?

What is Experience?

What is experience? Sometimes looking at the origin of words holds a key to their meaning. The term ‘experience’ is derived from the Latin word ‘expereri’, which means “to try.” One definition of ‘experience’ is “the apprehension of an object, thought, or emotion through the senses.” Another definition is “direct observation of or participation in events as a basis of knowledge.” The term ‘experience’ refers to the content of what happens when we consciously perceive something or otherwise encounter it directly. Experience is a form of knowledge. We encounter an object by interacting with it in some way and our mind creates a representation of the object that enables us to know something about the object. So when we look at a tree, our mind creates a visual representation of the tree, based on processing input from the tree, and this enables us to know what the tree is like. We have the experience of seeing the tree.

Notice that our mind is very creative in the process of perception. The fact that we perceive and experience the world as we do is very much a result of the particular sense organs that we have. If we had different sense organs, or if the ones we have were different, then we would experience the world very differently. It is only because all human beings have basically the same sensory structure that we can so easily move from “This is the way everyone perceives the world” to “This is the way the world really is.” In the movie “Pleasantville,” someone is able to actually enter into a town depicted in a sitcom. In this town, which is locked in a 1950’s way of seeing the world, all the residents see everything in black and white. This perception of the world in black and white is correlated with a complete lack in the ability of self-expression. As the new resident is able to show the town residents how to express themselves, they begin to see the world in color.

It is not hard to conceive of a world in which everyone is what we call “color-blind.” If everyone saw the world in black and white, then we would be convinced that this is the way the world really is, and that it exists in various shades of gray. Likewise, we can imagine a world in which our eyes are sensitive to a broader range of the light spectrum. In such a world, we would perceive many more colors than we do, and we would be equally convinced that this is “the way the world really is.” Our concept of “objective reality” is very much conditioned by and a result of the sensory structure that we happen to have, and if we had a different sensory structure, we would have a different conception of “objective reality.”

What are the implications of this relationship between our sensory structure and the nature of what we call objective reality? What it means is that our knowledge is relative to our human minds, and very much conditioned by the nature of our minds. Even though there is “a world out there,” our interpretation of this world is conditioned by our sensory structure. Does this mean that objects aren’t really red, that we only perceive them as red? Not quite, but what we can say is that we could append the following statement “from a human point of view” to every perceptual statement. So, “Roses are red, from a human point of view.” The sky is blue, from a human point of view. There is no “absolute” framework in terms of which the sky is “absolutely” blue. It will look blue to anyone with our same sensory structure. But if alien beings come to our planet and perceive the sky as flaming red, because their minds create a different representation of the sky than our own, then their perception is just as accurate as our own, relative to their perspective. To us, the sky is blue and to the alien beings, the sky is flaming red. We just have different points of view.

This may seem to be an extreme form of relativism, but if relativism is true, then it is true. There is still some room for “objective” reality, and this objective reality is what is common to the human experience. It also doesn’t mean that “everyone’s individual point of view is equally good,” since what is common to human experience provides a basis for “objectively” evaluating individual perception. This means that we can say, for example, that someone who is color-blind really has a defect in their vision since, when human

eyes work properly, they allow the subject to see in color. Nonetheless, everything is relative, and it is relative to our human minds.

Where Our Experiences Occur

Where do we experience our mental perceptions as occurring? Let us consider some examples. Psychologists report an interesting experience using vibrators that demonstrates the way in which both sides of our body work together. Psychologists report that, if two vibrators are held in the correct position on the thighs above either knee, that it is possible to experience a single feeling that is located somewhere between the two knees. Apparently the brain or mind attempts to unify these two perceptions into a single one and projects the feeling into space between the knees, much as our brains take separate input from both eyes and construct a single image from it. (Pribham, pages 168-170).

Spots in front of our eyes are a similar example. When we experience spots in our visual field, due to specks on the surface of the eye, the spots appear to be located in physical space, perhaps a foot or so in front of our eyes. Yet the spots are not literally in physical space, even though they have the appearance of being in space.

The example of hearing presents an even more interesting case. We experience sounds as occurring at their point of origin. If I hear the sound of someone hammering a nail in the distance, I hear the sound as coming from the point where the sound waves originate. There may even be a delay in hearing the sound due to the time it takes for the sound waves to reach my ears if the sound is far enough away. But even though our brains are processing this information, we do not experience the sound as occurring in our head, but as occurring somewhere out there in the world, at its point of origin.

Stereo headphones provide an example in which we do experience the sound as occurring in our head. When someone is listening to headphones, the sound originates just outside both ears, and the ears meld the two signals into a single perception that we experience as

occurring somewhere between our ears. This is a different example from the usual one in which sounds originate somewhere in the world.

What actually occurs when we hear a sound? Our ears capture the sound waves and transduce them into a series of neural impulses that are transmitted to the auditory cortex. Even when this occurs, it does not mean that the organism hears a sound, since he might be asleep or focusing on some other input. It is when the signals from a sound intersect with the neural impulses associated with consciousness that the organism has the experience of hearing the sound.

Where does the sound occur, and does it actually occur at any location? The best way to answer this question is to say where we experience the sound as occurring. And we experience sounds as occurring at their place of origin. This means that our minds actually project the representation of sound out into the world. It is the projective power of our minds that contains much of the key to understanding the mysteries of the mind. Sound is actually projected into physical space, much as spots in front of our eyes are; yet these sounds do not exist in physical space. Instead, they exist “in our mind” or in phenomenal space.

Physical Space and Phenomenal Space

When we locate an object in physical space, we use a set of criteria to determine if it is really a physical object. For example, physical objects take up space, they have weight, they have a certain appearance, are visible to more than one person at once, and they provide resistance if we try to lift them. Things are different in outer space beyond the pull of gravity, of course, but this is how physical things behave on the earth.

When we consider mental perceptions such as sounds or spots before our eyes, it seems that we can locate them with respect to physical objects. For example, the spots in front of my eyes might be located a foot from my eyes, and perhaps a few inches to the right of a lamp. But these spots fail the other tests we use to identify physical objects. Spots in

front of my eyes do not have weight, and they are not visible to other people. So they clearly are not physical objects.

How should we understand the relation between objects in mental or phenomenal space and objects in physical space? It seems clear that objects in mental or phenomenal space are representations of events occurring in physical space. For example, if someone is pounding the side of a house with a hammer, he is creating sound waves that are generated when the hammer strikes the side of the house. This physical event generates sound waves that are transmitted to the ears of a human being. The ears sense the waves and convert them into neural impulses. The ears act as sensor, transducer, and transmitter. When the sound waves from this event intersect with the waves associated with consciousness, the human being or organism hears the sound as occurring at the point where the hammer strikes the side of the house. The mind projects the sound out into the world, and that is where the representation occurs.

Does this mean that our experiences occur out there in the world? In a sense it does, although it doesn't mean that our experiences occur in the physical world, any more than spots in front of our eyes are physical objects. Our minds project some of our experiences and perceptions out into the world, and to that extent they occur "in" the world. But just where are they located; they clearly are not physical objects, and are not perceptible to others?

To answer this question, it is necessary to look at the structure of our minds. Our sensory system is the organ of experience. Our brains and minds are structured so as to provide experiential and direct knowledge of things in our environment. Without this knowledge, we would not survive very long. So our brain and mind is structured so as to enable us to experience the objects and events in our environment. For example, if a tree falls in the woods near us, it is important for us to hear this event or we might not survive it. So our ears detect the sound waves generated by the event of the tree falling. In order to enable us to take action with respect to the event, our ears project the mental impression we receive from this event onto the location where the event occurs. So we experience the

sound as occurring at the point where the vibrations in the air originate. By knowing where the sound is coming from, we can take any necessary action. Hearing the horn from another car while driving is a similar example.

Another way to understand this example is to talk about the interpretation of events in the world. Interpretation is parallel to transducing. To interpret something is to convert it from one form to another, using a set of rules. This is what interpreters do when they translate from one language to another. Using a set of rules, they attempt to state in one language, such as German, what was originally said in another language, such as English. In a similar sense, our mind is an interpreter of events in the world. Our minds use the sensory system in the body to sense what is occurring in the world and create representations of these events that are projected back to their point of origin. The difference between what the mind does and linguistic interpretation is that, instead of interpreting from one language to another, our minds are converting from events in the world to representations of those events.

This is also how seeing occurs. When we see an object, our visual system captures light waves from the object and creates a visual representation of the object at the point where the object is located. Without this projective power of our visual system, we wouldn't know where the things we see are located. When our visual system goes wrong and we experience hallucinations or illusions, then our sensory system is projecting images onto a point where nothing is actually located.

The Relations Between Mind and Body

So far, we have identified two relations between mind and body:

1. The mental powers associated with a sense organ define the function of the sense organ.

2. A mental representation is a representation of some event that occurs or exists in the world. This representation is projected onto the event by the sensory system, acting in conjunction with the sensory system associated with consciousness.

I will now examine the second relation in more detail.

How Mental Representations are Created

While there are many things that scientists still do not understand about our brains, we do know that our brains are divided into a number of different processing areas. There is a visual cortex that processes visual information and contains a map of the visual field. There is also an auditory cortex that is devoted to processing information fed into our brain through our ears. There are other portions of the brain devoted to other senses, such as smell, taste, and touch. In addition to this, there is a portion of our brain that controls the sleeping and waking cycle.

When we are awake, a portion of the brain sends powerful neural signals into other portions of the brain. These wavelike signals correspond to our attention or point of view in that the portion of the brain they are focused on is the one that we are attending to consciously. So if these neural signals are directed towards the visual cortex, then the subject is focused on something in his visual field. Likewise, if these neural signals are directed towards the auditory cortex, the subject will have the experience of hearing something.

Mind is a Representation of Events in the World

It does seem that most, and perhaps all, mental phenomena can be understood as representations of events in the world. This is certainly the case for hearing and seeing. Of course, when we experience illusions, then these representations do not correspond to anything in the world. It also applies to touching, tasting, and smelling, since in those cases our mind construct representations of different aspects of the objects being experienced. Our sensory system usually operates in a predictable way. Thus, salty

foods taste salty, sweet foods taste sweet, etc. Likewise, objects with a rough texture feel rough, and smooth objects feel smooth. Taste works the same way. Lemons usually smell the same from one time to another, and so do roses. This is because our sensory system creates the same representation each time, given the same sensory input.

Considering the projective nature of the brain and mind, it is a mistake for philosophers to focus so intently on brain states, and the relation between brain states and experiences. Obviously the role of the brain as the processor of sensory information is an important one. But it is only a part of the picture. The rest of the picture has to be filled out by the operation of the sense organs in capturing information, the interpretation of this information by converting it from one form to another, and the projection of the qualities perceived back onto the event in which the information originates. Focusing just on a brain state is misleading since we do not experience most of our mental representations as occurring in the brain. It is primarily our thoughts that we experience as occurring in the brain.

Still, skeptical philosophers might say “Perhaps you have shown that the relation between mind and brain is that mind represents events in the world, using the sensory system in the brain as a tool or mechanism for creating these representations. But you still haven’t shown how it is possible for mental representations to arise from physical events in the world.”

Mental Holograms

It is clear from what has already been said that mental representations occur as the content of the actions of our sensory system, and that we experience these representations as experiences in our mind. How do these representations come into being?

One important fact about our experience is that there is no way to infer from the activity of our sensory system what the content of the representations that the mind forms will be. For example, there is no way to tell what oysters will taste like until we actually taste them. We can look at them and form analogies with other similar objects in our

experience. For example, we might conclude that they will feel soft because they look soft, and we have felt soft objects before. But until we experience the taste, we won't know what they taste like.

A similar statement applies to other areas of experience. There is no obvious way to infer from knowledge of an object and knowledge of our sensory system to the mental representation our minds will form. Of course, once we have experienced the sensation of redness, if we know that an object is red, then we can infer that when we look at it we will experience some shade of redness. But there is no way to infer from the pattern of light waves associated with redness to the nature of the experience of seeing red. That is something that must be experienced to be understood.

This is why we have so much difficulty in understanding animal experiences. We can understand them to some extent by analogy with our own. But unless we can actually put on the eyes of a cat or the ears of a mouse, we cannot know what experience their sensory system creates from events in the world.

While the neural mechanisms that underlie conscious experience are still not well understood, some scientists suggest that it is through a kind of holographic process that mental phenomena occur. When we have a mental experience, the neural signals associated with consciousness are focused on the portion of the brain that is processing information from the object we are seeing. So if we are seeing a tree, then the neural signals are focused on the portion of the visual cortex that is processing visual information from the tree. These neural signals are wave-like in nature. And physical holograms occur when certain types of light waves intersect.

The comparison between physical holograms and mental phenomena is interesting in other ways. A physical hologram is visible and three dimensional, and it appears to be in space, yet it fails certain crucial tests that objects must pass to be physical objects. For example, physical holograms do not provide resistance when we touch them. It is doubtful that they could be said to have weight. They are, in fact, ghost-like structures,

yet they are real and they are also visible to more than one person at once. Holograms are also projected into space at the location where the object they represent originally appeared.

If we think of mental phenomena and experience as being a type of mental hologram, this helps explain one of the mysteries of mental phenomena: the phenomenon of projection. It is difficult to grasp how it is that our brain or mind can project a mental representation into physical space so that we seem to have the perception in physical space and yet the perception is not located in physical space. A physical hologram works by making a kind of physical record or hologram of the light waves that occurred where the object originally was located. Then when a laser beam is passed through this hologram, the light waves that originally appeared there are reproduced. As a result, an image of this original object appears at the same location as the original object. So if the hologram is of a tree, it looks as if a tree is located there even though it is only the physical image of the tree.

Another Look at Mind-Body Interaction

Let us take another look at mind-body interaction. The problem that was originally posed for a dualistic account of mind was that there is no apparent way for a mental event or object that does not take up space to interact with a physical or neural state that does exist in space. Since this time, we have made several changes in our concepts of mind and body:

- We have distinguished between two concepts of body: body-as-inanimate-object and body-as-sensory-system.
- We have distinguished between two concepts of mind: mind as the power of consciousness or awareness and mind as the content of our experience.
- We have suggested that mental phenomena occur in a holograph-like fashion when neural signals associated with consciousness intersect with neural signals that are processing information from the sensory system.

Where does this leave us with respect to mind-body interaction? Our problem now becomes one of explaining how it is that mental holograms occur as a result of the neural activity of consciousness and sensory processing.

One of the chief difficulties of mind-body interaction is solvable within the above framework. One of the criticisms of dualism is that within a dualistic framework, mind-body interaction cannot occur since there can be no point of interaction between a physical object that takes up space and a mental object that does not take up space. The concept being developed here makes it possible to account for mind-body interaction through the action of sense organs. Sense organs capture information from the physical world, create an internal representation of this information, and convert this information into a form the brain can understand. This information is then transmitted to the brain in the form of a neural pattern. When this neural pattern interacts with the brain waves associated with consciousness, the organism has an experience associated with the information captured by the sense organ. This experience is a representation of the event captured by the sense organ.

The Relation between Mind and Body

What is the relation between mind and body? The answer to this question is that mind is a representation of body. However, this statement needs to be qualified to be understood correctly. When I see a tree, my visual image of the tree is not a representation of the neural activity associated with the tree. Instead, my visual image of the tree is a representation of the tree, which is made possible by the activity of my eyes and the image that my eyes transmit to my brain. So my eyes are the tools my mind uses to create a representation of objects and events in the world. These representations are not representations of brain states or states of my sensory system. Instead, they are representations of what my sensory system is sensing or perceiving.

In order to understand how it is that mental holograms can occur, it is necessary to introduce the concept of frame of reference or point of view. When we look at objects in our physical world, we are using a physical frame of reference or point of view. A frame

of reference or point of view is set of criteria used to select out certain features and reject others. When we take a physical point of view, we are including objects that satisfy the criteria for something being a physical object, and we are rejecting things that do not satisfy these criteria. So we are looking for three-dimensional objects that are publicly visible to more than one person at once and also have weight and resist our touch.

When we use the frame of reference or point of view of our sensory system, we select out those aspects of the world that form part of our sensory system, to the exclusion of others. So our visual, auditory, olfactory, etc. processing systems are included, along with the brain that is the processing center for these systems. It is important to note as part of this analysis that our sensory system also passes the “physical object” test, since the brain and the sense organs exist in physical space. But they also include additional criteria since sense organs receive information from the world, process it according to rules, and transmit this information to the brain. So as has already been discussed, the sensory system acts as sensor, transducer, and transmitter. In addition, a sense organ is defined according to its mental function, so it is already partly mental in nature.

What happens when we look at the world from the perspective of the subject of experience? This involves another shift in frame of reference or point of view. Instead of trying to capture physical objects in our “conceptual net,” we are trying to capture “mental holograms” or the contents of mental experience. And even though a subject of experience is aware of his eyes and ears, he is largely unaware of the details of the operation of his brain or sensory system.

One of the problems in understanding the relation between mind and body is that when we move from describing a physical event or even a sensory state to describing an experience, there is a shift in points of view from a subjective “outside observer” perspective to the point of view of the subject of experience. This is necessary because mental phenomena occur from the point of view of a subject of experience. The representations that appear to a subject of experience cannot be viewed or observed from

the outside. Anyone who wishes to somehow infer from a physical state or a sensory state to a mental state has to take into account this shift in points of view.

What is the Subjective Point of View?

When I describe the world from a subjective point of view, I capture those events that are in my consciousness or awareness. This includes the way I see things, how they sound, my feelings towards other people, and my entire mental and emotional life. When I describe the experiences someone else is having, I am describing events from their subjective point of view. If I say “Kelly is tired,” then I am describing the experience of tiredness from Kelly’s point of view. I can understand her experience by analogy with my own.

Subjective experience comes about as a result of our sense receptors and sensory system. Because we have the capability of sensing different aspects of the world by means of our sense organs, events and objects in the world have an appearance to us. This appearance consists in the representations we create of these events and objects, using our sense organs. The appearance of a tree consists in the mental representation of the tree that is created in my mind when my eyes are processing information from the tree and the neural correlates of consciousness are focused on the visual information from the tree. Under these conditions, I see the tree. There is no mysterious “immaterial substance” that underlies this experience. The term ‘I’ simply refers to the mental experiences that originate in the sensory system associated with my body.

Describing this “how it seems,” “what it’s like,” “how it appears,” aspect of experience is what has long bedeviled philosophers of mind. But this need not be so difficult. We understand how things are from our own case, and we argue by analogy to how it seems for others. Thus we know from our own case what it’s like to be tired, to be in love, to feel cold, to hear music, etc. By making use of the principle that similar causes yield similar effects, we can understand what others are experiencing when they describe their own experiences.

Of course, this is not to say we can always understand how other people feel. For example, I think it is difficult for men to understand how women feel when they are pregnant. And those who have not been on a roller coaster ride may find it hard to understand that experience. Americans who have never gone hungry for even a day may find it hard to grasp what it's like not to know where your next meal is coming from. In many cases, others have experiences we cannot understand because the circumstances that give rise to these experiences are completely unlike our own. In those cases, we may still rely on analogy, but our understanding is somewhat limited.

People also may find it difficult to describe and understand crises in their own life. When faced with an extreme event, such as the loss of a job or rejection by a loved one, we may find it not only difficult to accept but also difficult to grasp or conceptualize. This could be because the event challenges a condition we've taken for granted. To use a term from the next chapter, we may be "conceptpoor" with respect to this event because we have never had an experience like it and we don't understand how to describe it. In cases like these, it is helpful to talk to people who have faced similar experiences, as they can provide perspective and, hopefully, some helpful advice based on their own experiences.

What is the Self?

What is the subject of experience or self whose point of view we adopt when we shift to a subjective perspective? Is the self an immaterial substance that has the property of having experience? Or is the self instead a construct of our minds, something that is required by the nature of our language?

How does the idea of self originate? We learn to distinguish ourselves from others, and from the world around us, when we are very young. When children are learning to speak, they are discovering the limits of their own bodies, that they have a certain type of control over their own bodies, and that their ability to exercise this control ends at the border of their skin. Likewise, they learn the concept that there are other beings like them who have a similar kind of control over what they call "their own bodies." A child learns to use the term "I" when referring to experiences he is directly aware of, and also

learns that other people do the same thing. He also learns to use phrases like “My body” and “My mind” to refer to different aspects of his experience.

The concept of self is inextricably tied up with the concept of “other.” What does not belong to the self either belongs to some “other,” or it is part of the world outside the self and body. We need the concept of self to distinguish those elements of experience that originate within our own bodies from those that originate outside our bodies, and from those that originate in the bodies of other human beings. Without the concept of self, it would be very difficult to ascribe ownership to our experiences, or to the experiences of others.

To what does the term ‘I’ refer? Is there an immaterial substance called “mind” or “self,” as Descartes would have us believe? Or is the concept of self simply a mental construct that we use to organize our experience?

I believe that there are really two concepts to be distinguished here. These two concepts are the concepts of “person” and the concept of “self.” The concept of person is a moral and legal concept that plays a fundamental role in society. A person is a moral being, and he or she is a multi-faceted combination of mind, body, soul, and spirit. In the sense of person, my body is just as much a part of my person as is my mind, and when I touch another person’s body, I am touching another person. There really is no substance corresponding to the term ‘person’; the concept of “person” is a construct of our minds. Without the concept of person it would be very hard to write and enforce laws, or even to ascribe moral responsibility. A person is a synthetic union of mind, body, soul, and spirit that can be uniquely identified by certain attributes such as date of birth, physical location, etc.

The concept of “self” in a way is more interesting and challenging than the concept of “person.” Is the self always what the term “I” refers to? Suppose I say “I am tired,” “I am excited,” “I weigh 150 pounds,” “I love you,” “I was born in June,” etc. Am I

referring to the same entity in all these statements? Or does the term “I” sometimes mean “self” and sometimes mean “person”?

In answering this question, it is important to keep the following fact in mind: What we identify with the “I” corresponds very closely to our point of view. What this means is the following. Our minds are constantly creating representations of the world, including visual, auditory, olfactory, tactile, etc. This means that we are constantly being bombarded with sensory impressions. We see, hear, touch, taste, and feel many things simultaneously. How do we know or decide from among this mass of perceptions?

An individual who is incapable of choosing or selecting from among his many simultaneous experiences would either go insane or would have no core identity or concept of self. If my experience is nothing more than “streaming consciousness” with no control or selectivity in the experiences involved, then I have no control over what I experience. Such a life would be intolerable.

Fortunately, we do have the capability of being selective in our experience. As has already been discussed, the concept of focus is built into the biological structure of our eyes. Our vision is set up in such a way that we are always focusing on what is at the center of our visual field, and the rest of the world becomes increasingly fuzzy at the edges. We can control what we are focusing on by moving our eyes around, as well as our head, to bring certain objects into better focus. Our hearing is constructed in a similar way. We can’t easily move our ears, but we can move our head around to better hear certain things. And we can pay attention to a particular sound to the exclusion of others. For example, if I think there is an intruder in the house, I will be listening intently for footsteps or a creaking door, and will “block out” my cat’s meow or the sound of the mattress as I leap up from it. The other senses exhibit a similar feature.

Not only can we be selective in what particular thing we are seeing, hearing, etc., we can also be selective in which sense organ we are attending to. Most people are visually oriented, so this is the sense they focus in on most. We also take in a tremendous amount

of information through our eyes. Many basic and necessary human activities, such as driving, walking, eating, and having sex either require or are greatly enhanced by vision. We can also choose to focus exclusively on one sense. For example, anyone who listens to music intently may try to block out any distractions, including any visual distractions. Listening to music while lying down with your eyes closed is an excellent way to focus in on the music and minimize distractions from the other senses.

We identify the self with whatever perception or activity we are focusing on at any given moment. For example, a person who is lying down with his eyes closed and listening to music through headphones, if asked “What are you doing?” will most likely say “Listening to music.” This is true, even though he is also lying down, may be dimly aware of the feel of the sofa, may even be thinking about some project at work, and may be experiencing a series of images in his visual field. Of course, someone may appear to be doing one thing but really be doing another. For example, someone may appear to be working but may really be planning his next vacation. Or someone may appear to be listening to what I say, but their mind may be “a million miles away.” This is an all-too-familiar story.

Of course, we can also do two or more things at once. For example, right now I am writing this chapter and listening to music through headphones. The trend today, especially for kids, is to do many things at once. The reason for this is that with the presence of so many different sources of input, it is possible to have multiple inputs at the same time. Parents, who are used to their now outmoded way of being, decry this trend. In the 1950s, students went to school and sat in uncomfortable chairs while they proceeded in a linear fashion to study one (often boring) subject after the other. There was very little television, movies, few computers, no Internet, no CDs, etc. (How did we survive?) Today there are a wide variety of sources of knowledge and pleasure, and anyone who isn't aware of them is simply not keeping up with the times.

If “I am listening to music” is true because my mind is focusing on that experience, then does what does this mean about the reference of the term ‘I’? Is there an immaterial

substance inside me, and that substance is listening to music? Of course, if I am doing three different things at once, is this immaterial substance also doing three different things?

Do I Exist?

In considering the question of the nature of the self, it is interesting to look back at Descartes' Meditations. Descartes used his own existence as the starting point for this attempt to construct an irrefutably certain structure of knowledge. Unfortunately, while Descartes seemed quite certain of his own existence, he was less articulate in explaining what it is that exists, given that he exists, or what the 'I' refers to. Sometimes Descartes identifies himself with his mind, and sometimes he talks as if he is the union of mind and body. Descartes' problem was that his dualism didn't allow him to recognize a separate structure called "self" apart from mind, and he was thus never able to give an adequate account of his self.

On the other hand, there have been skeptics about the nature of the self. Hume's theory of the self as "a bundle of perceptions" is well known. Eastern philosophers say, "the self is an illusion." So is the self a substance, or simply a construct of our minds?

We use the term "self" to specify what experience or experiences we are selecting from among a vast array of choices to focus in on at the moment. If I am focusing in on the music I am listening to, then I say "I am listening to music." If I am focusing in on the television, then I say "I am watching television." If I am trying to do some homework, then I say "I am studying." Or, I might be doing all three at once, in which case I could say "I am studying while watching TV and listening to music." Someone who is doing this might be switching their attention from one to another, as from the TV to the music, or they might actually be doing all three simultaneously. We can be aware of more than one thing at a time, and we can certainly be doing certain things "in background mode" while mainly focusing on something else. Driving while listening to music is a good example of this.

When a person selects something out of their array of experiences to focus on, they are taking a point of view. If I decide to look at a tree, then I have a point of view of the tree. If I decide to focus in on the music, then I have a point of view of the music, and I am listening to music. So there is close connection between the concept of a point of view and the concept of self. This doesn't mean we should identify the self with our point of view, since "I am seeing a tree" does not mean the same thing as "My point of view is seeing a tree." But what point of view I take, meaning what I focus on, determines what characterizes my self at that time.

The concept of will and intention are also involved in the self. Taking a point of view involves an act of will. The term 'will' is the term we use to describe the faculty of decision-making. In many cases, what I am doing is whatever I have decided to do. If I decide to take a shower and then implement my decision, then what I am doing during this time is defined by my purpose of taking a shower. This is not merely a matter of taking a point of view, but instead involves forming an intention to do something and then following through on that intention.

Self and Point of View

While it is probably not correct to identify my self with my point of view, we can say that the self is "the thing that has the point of view." What, then, is the thing that has the point of view? To understand the answer to this question, I will discuss how the concept of self arises.

Infant Experiences

Experience for a child begins before birth, in the womb. Let us consider an infant in the womb. At first, nothing is occurring in terms of experience, as the child has not yet attained any sort of awareness. The biological and neurological structure is not yet complex enough to support experience. Eventually, the child becomes dimly aware of some type of sensation occurring somewhere in his or her vicinity, perhaps a sensation of warmth or cold. What is happening is that the temperature receptors are becoming sufficiently developed to create a mental hologram of the temperature in the womb. This

sensation is occurring at the animal level, since the child has no language and is completely lacking in the ability to conceptualize his or her experience. Over time, these sensations increase in frequency as the sensory system becomes more developed.

After birth, infant experiences change dramatically, and become much more numerous. Yet a child has to learn how to distinguish his own body from the rest of world. A child at first has no reason to believe that her body is any different from other aspects of his surroundings. Eventually she learns that she has a kind of special control over those things that stick out from beneath her head. Over time she begins to develop a concept of self, as she learns to distinguish where the part that he has control over ends and the rest of the world begins.

For the first year, most children cannot speak. So any conceptualization of the self must occur at the sub-linguistic level. Once a child begins to speak, she will learn to use the word 'I' along with other pronouns to refer to other people. At this point, the child begins to develop a more complete concept of self, and the idea of ownership of experiences emerges. The child might first learn to say "It hurts," and eventually move to "I hurt" or "My foot hurts." The child develops the concept of self to distinguish those aspects of experience that he experiences directly from those that either occur in others or from external objects that have no experiences. Thus the concept of self is intimately related to the concept of "other" and develops as a result of a child's need and desire to draw a boundary line between his own self and the rest of the world.

Is the Self an Immaterial Substance?

If the self is "the thing that has a point of view," does this require the existence of an immaterial substance to "have" a point of view? David Hume observed that when he tried to find a substance that corresponds to the term 'self', he could not find a substance, but only a particular perception. Our concept of self is to some extent a result of the subject-verb nature of our language, which seems to require that every noun name a corresponding object. If I say "I am tired," then the pronoun "I" seems to designate a

thing that has the property of tiredness. Pronouns, proper names, and common nouns all seem to have this “thing-naming” property.

It may be beneficial here to follow Hume in saying that there is no substance, material or immaterial, named by the pronoun ‘I’ or the term ‘self.’ Instead, the concept of self is a construct of our language and our experience. We use the concepts of “I” and “self” to distinguish what is happening within our own minds and bodies from what is happening outside our minds and bodies and inside the minds and bodies of other people. But the truth of our statements about the self does not require the existence of an immaterial substance called “self.” It only requires that we have a mind and a body, and the capability of taking a point of view. If we have these elements, we have all that is required to have a self. And we can argue by analogy with other organisms, both people and animals, that they also have a self, provided that they satisfy these three criteria.

Self is the Power of Attention

Even if there is no immaterial substance called “self,” there is a very close connection between the concept of self and the concept of point of view. Our consciousness has a focused quality to it. When we look at a scene, there is an area that is the center of consciousness. Around this area is an area that we are not focusing on, but that we can still see. If we want to focus on something else in our visual field, all we need to do is move our eyes and shift our attention to that thing. What we are looking at is normally considered to be what our eyes are focused on. In this sense, our visual field is like a series of concentric circles, where the center circle represents the area of focus, and the surrounding circles represent areas that we are not focused on and therefore less aware of.

This point-of-view-like character of vision also applies to the other senses. We can focus on a particular sound within a large number of sounds, just as we can focus on a particular part of our visual field. Whatever sound it is that we are attending to determines what we are listening to. If we are listening to the sound of the stereo, then we are listening to music, even if the noise of the freeway can be heard in the

background. It is what the person is listening to that determines what he or she is doing at that time.

In addition, we can rotate our conscious among the different senses. Someone seated at dinner in a restaurant, and carrying on a conversation, is likely to shift their attention from the other person, to the food, to the surroundings of the restaurant, to the waiter, etc. At any given time, we may say that this person is engaged in conversation, checking out the people at the next table, trying to flag down a waiter, enjoying his or her food, listening to the music in the background, etc. All these different descriptions apply as the person shifts attention from one thing to another, using first one sense and then another. Of course, enjoying food involves multiple senses, just as driving involves both seeing and hearing. But what we say a person is doing at any given time is determined by what his or her attention is focused on.

Given this close connection between what someone is attending to and what they are doing, it seems that this concept of what someone is attending to may contain the key to the concept of self. It is our power to focus our attention, both within our visual and sensory fields, and among different sensory and perceptual inputs, that determines what we are doing on any occasion. Our self, then, is the power of attention, or the power to attend to or focus on different aspects of the world and of our selves. This is not so much a mental substance, as it is a capability that is the result of the way in which our mind and brain is constituted.

Mind-Body Interaction Reconsidered

Let us return to the question of mind-body interaction. The traditional objection to Cartesian dualism, often stated as a question, is “How can a nonphysical mind interact with a physical body? Where is the point of interaction?”

Descartes’ famous answer to this question is that the point of interaction occurs in the pineal gland. In *The Passions of the Soul*, Descartes reasons that since we have two of everything connected to our senses, including two ears, two eyes, two hands, etc., there

must be a place in the brain where the two images presented by these double organs come together. Otherwise, we would always be seeing double. Descartes' choice of the pineal gland as the locus of interaction, which there is only a single version of, has not been borne out by neurological research. On the other hand, Descartes' reasoning here is sound, and our brain or mind does synthesize the double inputs into a single image so that we don't see two of everything. This occurs somewhere in the brain, although it probably does not occur at the same location for every sense.

It should be clear by now that our sense organs provide the means by which information about the world enters our mind. Our ears are sensitive to vibrations in the air. Vibrations in the air are a physical phenomenon that can be created by the action of physical objects. When a book is dropped onto the floor, it sets off physical vibrations in the air that encode this event. These vibrations are captured by our ears, and cause our eardrums to vibrate (usually both of them). The vibration of the eardrums causes a corresponding vibration in the fluid of the inner ear. The vibration of this fluid in turn sets the roots of the cilia, or hair, in motion. The motion of the cilia converts the mechanical vibration into electrical energy that is sent to the brain. This electrical energy constitutes a neural encoding of the sound that began as physical vibrations in the air set off by a book being dropped on the floor.

The above discussion shows how a physical sound in the form of a physical vibration in the air is encoded as an event in the brain. This takes us from the physical-mechanical level through the biological level to the neural level. Yet, materialists would argue that we are still at the "physical" level, since they claim that mental events occur in the brain. What happens in the brain, and how does this become the basis for the perception of sound?

One important concept to understand when discussing these issues is the concept of mapping. The retina in the eye contains a map of the visual world, and the ears also contain a map of our auditory field. This visual and auditory portions of the brain contain a corresponding map of our visual and auditory fields. In addition, there are neural

impulses associated with consciousness, and when these impulses are directed on a particular portion of the brain that encodes a sight or sound, we see or hear the encoded event.

When the neural impulses associated with consciousness intersect with a portion of the brain that encodes a sound-event, we experience the encoded sound. What is the relation between the neural event, consisting of the intersection of “consciousness” waves with the mental event that my experience of the sound of a book being dropped on the floor? Materialists who are identity theorists would have us believe they are one and the same, while Leibnizian parallelists would say that the two events are in parallel but not identical. Another position is that the neural event causes the mental event. A position I defended in my PhD dissertation is that the neural event is actually a component of the mental event, and that the mental event has both a physical and a mental aspect.

What is the nature of the mental event? The mental event is the sound of the book falling, which we experience as occurring at the point where the book falls. This is actually the point where the sound waves of the event originate. The sound we hear appears to be projected into space, and yet is not located in physical space. The sound we hear represents our mental interpretation of the physical event. It is no more in physical space than dots in front of our eyes are located in physical space – even though they appear to have spatial location. Furthermore, the sound I hear is a private mental event that is not available to anyone else, even though they can have a corresponding mental event if they are in a position to hear the book drop.

The preceding discussion shows that materialism is not true, at least not a form of materialism that seeks to identify the neural event with the mental event. The mental event has properties the physical event lacks. The mental event is private to the listener, and also does not exist in physical space. A neural event, along with the sound waves that encode the physical event, is public, at least in theory, and also takes place in physical, or at least neural, space. So any attempt to identify the sound I hear with the brain state that underlies this sound is mistaken.

Even though there are some parallels between the physical events that underlie my hearing a sound and the sound itself, it should be clear that there is no way to infer from the properties of the vibrations in the air, or from the properties of the neural event, to the phenomenal quality of the sound itself. Of course, once I know what the sound of a book being dropped on the floor is like, and know what physical events underlie this phenomenon, it may then be possible to draw an inference about the sound from the physical phenomena. This is possible, using the principle “Like causes yield like effects.” This is the same type of reasoning we use when we think, “I know what this lemon tastes like, because I’ve tasted lemons before.” But there is no a priori way to reason from the properties of the lemon to its taste, unless we’ve tasted lemons before. Of course, if we’ve tasted sour things before, we can reason by analogy, but this is using a variation of the same principle, which is “Similar causes yield similar effects.”

Previously I said that the change from describing the physical events underlying mental event such as hearing a sound to describing the mental or phenomenal event itself involves a shift in points of view. The shift is from the frame of reference of the physical or neural world to the subjective point of view of the subject of experience. I then said that we tend to identify the self with whatever point of view we are taking at the time. I then looked at the concept of self to see if this concept would shed any light on this switch in points of view. The concept of self turns out to be identified with the power of attention. What role does the concept of self as power of attention play in mind-body interaction?

Self and Mind-Body Interaction

If we analyze the expression “I see a tree,” it should be clear that there are three components involved: the “I” or self, the mental representation of a tree I have, and the physical tree that is the point of origin for this mental representation. Most discussions of mind-body interaction try to give an account of this relationship without involving the self. Perhaps understanding that self is the power of attention will help understand the mind-body relation better.

When I see a tree, there is a representation of the tree in my mind. However, this can be true even though I am not focusing on it. In order for me to be seeing the tree, my attention must be focused on this representation. The concept of mind is broader than the concept of self. In many cases, there are many different representations going through my mind. Using the restaurant example again, someone who is carrying on a conversation may be dimly aware of music in the background, conversation at neighboring tables, the taste of the food, waitpersons passing by, and other distractions. He or she can only focus on one or at most several of these things at once. Hence, even though we may have many things in our mind at once, only those that we attend to are ones that involve our self.

One problem with trying to move from the neural to the phenomenal level is that we are for the most part completely unaware of our brain. What we are aware of is our physical body, including our sense organs. But the brain is hidden away inside our head, and therefore is not readily accessible. What scientists have done in discovering how our brains work is very valuable for research purposes, but it does not ordinarily play a role in everyday life. Even sense receptors are for the most part below our level of awareness. We live in the world of fingers, toes, eyes, ears, and hands, and physical bodies. How our mental representations are created is something that we are not normally aware of.

The term ‘consciousness’ is not a value-neutral term. In fact, to be conscious of something is to have a form of knowledge of it. Our sense organs provide us with a means of knowing the world. There is obvious survival value to this. If we don’t see the large tree about to fall on us, or hear the crashing waves immediately behind us, we won’t be around to tell the tale. Our minds create phenomenal representations of things and events in the world so that we can respond appropriately to them.

What is a phenomenal representation? Suppose I am listening to headphones and I hear music “in my head.” The music is not literally in my head, at least not in my physical head, but the events in my brain have an appearance to me. They are somewhat like the

waves of the ocean lapping inside my head. The sound I am hearing is a soft, gentle sound of a piano playing. These waves create an appearance of the event that they map. This appearance duplicates certain properties of the original event, but its quality cannot be inferred from the physical events themselves. The interaction of the sound of the piano with my auditory cortex creates an appearance of this sound event that only I am aware of.

Even though my ears are picking up sound waves from the piano, and sending these waves in encoded form to my brain, I don't hear this music until I focus on these representations. Being able to do this is part of learning to use the brain. There is a neural correlate to the act of focusing attention, and it is something we learn to do as we grow up. Just as we must learn to shape our mouth in the correct way to form words, so we learn to use our brain to pay attention to different aspects of experience. This is something we learn to do by trial and error. While we don't fully understand how the brain works, we do learn how to initiate the neural impulses required to speak, to walk, and to pay attention to different aspects of our visual and auditory fields.

Mental Events as Macro-Level Properties

When I put my fingers near a candle flame, I feel the heat of the flame. The heat receptors in my fingers are sending a "Heat is here!" message to my brain. My brain takes this message and creates a representation of this event in my fingers. Assuming that my power of attention focuses on this representation, I feel the heat.

What is the nature of this representation? I have already observed that there is no way to infer from the description of the stimulation of my heat receptors, or from the description of the neural events that encode that stimulation, to the subjective qualities of the feeling of heat. On the other hand, once I have experienced the feeling of heat, and can observe the same physical events that caused this feeling in the past, I can safely infer how the heat will feel. In particular, if I have placed my hand near a flame before, and felt heat, I have a pretty good idea of how it will feel if I place my hand near a flame again.

In Minds, Brains, and Science, John Searle compares the relation between mental representations and the underlying physical events to the relation between the solidity of objects and the liquidity of water to the underlying molecular structures that cause these properties. Searle distinguishes between the micro-level and the macro-level, and says that in many cases objects exist at the macro level have properties that are not shared by entities at the micro-level. For example, the liquidity of water is something that water has at the macro level, but the individual molecules that make up water do not share this property of liquidity. Likewise, the desk I am typing on is solid, but the individual molecules that make up the desk are not solid. In fact, it is the motion of the molecules that creates the apparent solidity of the desk.

Searle compares this analogy to the relation between mental representations such as feelings and the underlying neural events. The stimulation of touch receptors, along with the corresponding neural events that map this stimulation, occurs at the micro-level. The feelings that these neural events give rise to occur at the macro level. These feelings may in fact have properties that are not shared by neural micro-level events. If we consider a feeling of pain, which is a parallel case, this point is a little clearer. A feeling of pain can be throbbing, intense, unpleasant, and unbearable. These are not qualities we would ascribe to the neural states underlying the feeling of pain.

We are used to thinking of our body as a physical thing and our mind as a mental thing. We also tend to think of the mind as somehow sitting on top of our brain. Yet our body has a mental component as well. When I stick my hand into hot water, I have a feeling of heat in my hand. This feeling is the result of the stimulation of my heat receptors, but it is not identical to that stimulation. Instead, it is a mental representation of the condition of my hand. This mental representation occurs in my hand. My hand, then, is not a purely physical thing, since it can contain feelings. These feelings represent different physical conditions of my hand, such as feeling hot, feeling cold, feeling tired, etc.

The human body is a complex sensory system that contains many different types of sense receptors throughout. When these sense receptors are stimulated, they create a sensory

field that represents some physical or biological condition. If this sensory field becomes the focus of attention on the part of the mind associated with this body, the person becomes aware of this sensory field, and has the corresponding feeling. This feeling represents the appearance of the condition that the sensory field represents. While there is no way to reason from the physical condition or the nature of the sensory field to the feeling, once we have the feeling, we will begin to associate that condition with the feeling. So once we know what it's like to feel heat, we will come to expect this feeling, or something like it, the next time we are in the vicinity of heat.

Mental Events are the Appearance of Sensory and Perceptual Fields

So far I have discussed the way in which our sense receptors send information to our brain, where it is mapped in the form of neural events. I have also said that these neural events somehow give rise to feelings, perceptions, and thoughts. The question of how this occurs, however, may still seem to be unanswered. How do feelings, perceptions, and thoughts arise from neural events that encode information from our sense organs?

I believe that this question is wrongly phrased. I have already said that there is no way to infer from a description of a physical or neural state to a description of a corresponding mental phenomenon, apart from experience. Once we feel heat, we understand what it's like to feel heat. Hence, if we find that our heat receptors are stimulated, as they are in the presence of heat, we can reasonably infer that we are going to be feeling heat. Once we have had the experience associated with a neural or physiological condition, we can establish a reliable connection between the two.

I believe the general answer to the question "What is the relation between neural or physical events and mental events?" is that mental events represent the appearance of neural or physical events. Consider thoughts for a moment. Most people constantly have thoughts running through their mind. These thoughts could not occur without knowledge of language. When we learn language, we learn how to produce sound-images in our minds. We also learn how to combine these sound-images into meaningful strings of words that people call sentences, or thoughts.

How are the sound-images called thoughts produced in our minds? These sound-images are stored images of sounds we have heard. We have the capability to not only store sound images, but to reproduce them, using our vocal cords. As we learn to internalize these sound-images, we have complete thoughts that are private to ourselves, and that no one else can know about, unless we tell them. This is all possible due to the complex nature of our brain that can store memories and then retrieve them at will.

When we have a thought, it is due to some type of brain activity or neural pattern. The thought is the appearance of this neural pattern. When I have a certain thought, a certain type of neural pattern is occurring in my brain, and the thought is the appearance, or phenomenal aspect, of this neural pattern. Likewise, the sound of a book dropping is the appearance of the chain of events that begins with the vibrations in the air, continues through the vibration of the eardrum, and ends with the neural encoding of the sound in my brain. This sound is what I uniquely hear when my brain encodes that particular physical event that we call a book dropping.

Mind-Body Interaction Explained

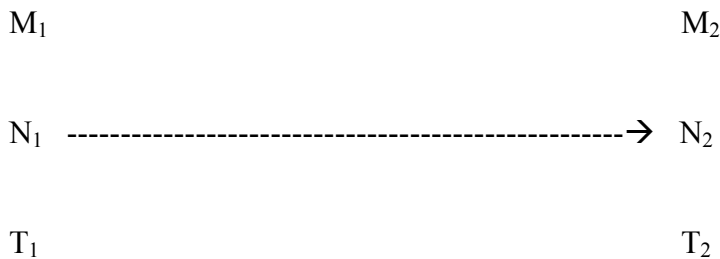
If we think of mental events as the appearance of physical events, and the mind as the appearance of the body, it also provides a way to explain mind-body interaction. One problem people raise in connection with mind-body interaction is explaining how we can voluntarily control our body. How can someone decide by an act of will, which is a mental event, to raise their arm, which is a physical thing, and then do it?

The answer to this question is that we learn from experience how to produce those changes in our body that generate the desired results. While walking and talking seem completely natural to most people, we tend to forget that there was a time when achieving these goals required climbing a fairly steep learning curve. Learning to walk involves many missteps, and is a result of trial and error. Likewise, learning to talk requires learning how to make certain sounds, and this is also a matter of trial and error. Anyone who has learned a foreign language as an adult knows how difficult an experience this can be.

Most people don't understand how they control their brains to produce the desired results, but this doesn't prevent them from doing so. Once we learn the correct way to shape our mouth to create the French "R," we can do so again and again. This is a learned behavior, just as is playing the piano or learning to play racquetball. We learn from experience how to send the correct signals to our brain to produce the desired results. Eventually these signals become automatic, and we can produce them without thinking.

The thought "I will raise my arm" is the appearance or phenomenal aspect of a neural event that initiates a sequence of neural and muscular events that result in my arm's going up. Since neural aspect of the thought is part of the thought, its neural component, we can say that the thought is the cause of the bodily changes that occur. Figure 3-1 shows a diagram of this interaction.

Figure 4-1. A Diagram of Interaction Between Thoughts and Neural Events.



In the above diagram, T_1 is a thought have mental aspect M_1 and neural aspect N_1 . T_2 is a different thought having neural aspect N_2 and mental aspect M_2 . The neural aspect N_1 initiates causal neural activity, e.g., by firing an action potential, resulting in neural state N_2 , which is a neural aspect of thought T_2 . In this way, thought its neural aspect, a thought can act directly on the brain. (There is no need for T_2 to be an aspect of a mental event.)

This solution to the problem of mind-body interaction places a lot of emphasis on learning to make this interaction possible. Just as we must learn what neural commands

are involved to produce certain sounds, so we must learn what neural patterns are associated with an act of will. For me to be able to raise my arm intentionally, I have to be able to produce the appropriate neural patterns. Persons who suffer a stroke can sometimes have difficulty reproducing the correct patterns for certain types of activities. This may be because some relevant portions of the brain involved in producing these results have been damaged.

How does this way of viewing mind-body interaction apply to examples of sensation and perception? Just as we learn how to control our brain, so we also learn what the appearances of certain physiological and neural states are. When I hear rain on the roof, this condition has a certain appearance. There is no way to explain how this sounds; this just is what rain-on-the-roof sounds like. Likewise, oysters have a certain taste. Again, this taste is the appearance or the phenomenal aspect of the condition that occurs when oysters are stimulating my taste buds. This just is what oysters taste like; it's something we learn from experience. Of course, once we have the experience, if we want to have it again, we know what to do.

Let us return to John Searle's suggestion that mental events occur at the macro-level, while neural events occur at the micro level, disregarding for the moment the fact that there are additional levels below the neural level. Another way this idea is sometimes presented is to say that mental events are emergent properties of neural or brain events. An emergent property is one that occurs or emerges at a higher level, but does not hold at the lower levels. So solidity is an emergent property of physical objects, even though the component molecules and atoms cannot be said to be solid.

If we take this view, we can say that some neural events have the emergent property of having an appearance, and this appearance is something we discover through experience. Yet because the appearances of neural events, which are mental in nature, occur in our brain, and only we have access to our brain, these appearances are private and subjective. This is a vindication of Descartes' view of the mind, which says that mental phenomena are private and subjective. Yet because these appearances are appearances of neural

events, the problem of mind-body interaction is resolved. Mind and body interact when the neural aspect of a mental event initiates some sequence of events that results in some physical action occurring. There is no need to claim that the appearance itself acts causally on the body; instead, the neural aspect of the appearance initiates the causal sequence.

Soul and Spirit

It is unfortunate that, in their enthusiasm to explain the nature of mind, many philosophers have chosen to ignore the concepts of soul and spirit. These concepts play a very important role in our ordinary lives, yet they are not widely discussed in philosophy of mind. I will conclude this chapter with a few comments on the concepts of soul and spirit.

Earlier in this chapter I alluded to a picture of a person as a combination of mind, body, soul, and spirit. I believe that we define the concepts of soul and spirit in terms of single attributes, just as the mind can be defined in one sense as the power of awareness or consciousness. Some philosophers may prefer to view the power of valuing and the power of expression as components or aspects of mind. I believe they are different from mind, and should be treated differently.

The term ‘soul,’ of course, has a religious sense in which it is the part of a person that survives death and lives on in another form in another world. I am not using the term ‘soul’ in this sense. Rather, I am using the term ‘soul’ in a nonreligious sense, which is exemplified in the phrase “I feel happiness in my soul.” What is common to cases in which the idea of soul is invoked is that some type of judgment or valuation is occurring. I believe, therefore, that the soul can be defined as the power of valuing, or assigning value.

The term ‘spirit’ is used to refer to idea of being animated, as in “a spirited conversation.” In fact, the spirit of a person is the person’s animating force. While the idea of spirit, then, is closely linked to the concept of life, I believe that it is most correctly

characterized as the power of expression. When we express ourselves, there is something internal that comes out, and this capability is a manifestation of spirit.

The concept of person that emerges from the above discussion is as follows. Body, mind, soul, and spirit are components of the person. There is a “core self” that makes decisions about which of these components to focus on and identify with at any given moment. This “core self” is the same self that was discussed earlier and identified with the power of attention. This power has to include the power of decision-making, since we are constantly deciding which aspects of our self to focus on and attend to.

Figure 4-2 shows a diagram of these relationships.

Figure 4-2. A diagram of the relationships among body, mind, soul, spirit, and self

