

Article

## What We Can Learn about Consciousness From Altered States of Consciousness

Imants Barušs\*

Department of Psychology, King's University College at The University of Western Ontario

### ABSTRACT

Philosophers and other scholars sometimes take their own experience to be the measure of reality in theories of consciousness. The purpose of this paper is to present some data from altered states of consciousness that need to be taken into account in any adequate interpretations. At the outset, the four common definitions of the term consciousness are clarified and the spectrum from materialist to transcendent beliefs about consciousness and reality held by consciousness researchers is presented. This is followed by a list of alterations of consciousness. In the substance of the paper, three salient issues are presented: feelings of reality, anomalous information transfer, and somatic plasticity. In each case, some of the implications for theories of consciousness are discussed.

**Key Words:** altered state of consciousness, reality, experience, definition of consciousness, materialist, transcendent, feelings of reality, anomalous information transfer, somatic plasticity.

### Clarifying the Study of Consciousness

Philosophers, psychologists, and other scholars sometimes take their own experience as the measure of reality in their theories of consciousness. Or, to use methodological terminology, their theory is based on a sample size of one and the inherent limitations of that single individual. So, for example, by looking to his own experience, William James found that thinking (which, according to James, is what consciousness is) is just the breath (James, 1904, p. 491). Daniel Dennett proposed a cognitivistic theory of consciousness that fit “all the dear features” that he had discovered in his “inner life” (Dennett, 1978, 173). And so on. I am not criticizing the effort to look to one’s own experience when theorizing — it is, in fact, necessary to do so — but, instead, I am asking for respect for the limitations of such a methodology and for attention to reports of events that lie outside of its boundaries. There is much to be learned from research into altered states of consciousness that bears on any theories of consciousness, in particular, and theories of mind and reality in general. In this paper I clarify some basic matters concerning the study of consciousness, then provide a list of alterations of consciousness, and, finally, discuss three issues that arise in the context of altered states of consciousness that have implications for understanding consciousness.

---

\* Correspondence: Professor Imants Barušs, Department of Psychology, King's University College at The University of Western Ontario. E-Mail: [baruss@uwo.ca](mailto:baruss@uwo.ca)

In order to clarify some basic matters concerning the study of consciousness, it is necessary to delineate the four main definitions of consciousness that I have found in the academic literature. I have numbered these as consciousness<sub>1</sub>, behavioural consciousness<sub>2</sub>, subjective consciousness<sub>2</sub>, and consciousness<sub>3</sub>. Consciousness<sub>1</sub> refers to an organism's ability to discriminate stimuli and act in a goal-directed manner as determined by outside observation of the organism. How much discrimination and goal-directed activity is necessary is clearly a variable for which one can choose a lower bound. One can also restrict the definition to particular classes of organisms such as vertebrate animals thereby excluding invertebrates, plants, robots, and so on. Behavioural consciousness<sub>2</sub> can be conceptualized as the application of consciousness<sub>1</sub> to itself and refers to an organism's behavioural demonstration of knowledge of its own situation. Behavioural consciousness<sub>2</sub> can also be regarded as an operational definition of subjective consciousness<sub>2</sub>, which refers to the stream of the explicit contents of one's awareness. Or, to give a closely related meaning, subjective consciousness<sub>2</sub> refers to experiential events characterized by intentionality. Consciousness<sub>3</sub> is the sense of being that a person has for herself; what we could call *existential qualia* (Barušs, 1987; 1990; 2008). It is important to distinguish between these meanings in that, for instance, consciousness<sub>1</sub> can be nonconscious relative to subjective consciousness<sub>2</sub> and it is important not to infer that data about one meaning of consciousness automatically applies to another (e.g., Barušs, 1992). Throughout this paper I will use the word "consciousness" to loosely denote this constellation of meanings, some of which might be more relevant in a particular instance than others, and will refer to the specific meanings as necessary.

Often researchers use the notion of consciousness, not in a technical sense, but as a Rorschach blot on which to project their favourite ideas about the nature of reality. These ideas are not necessarily based on empirical research or logical reasoning, but are simply beliefs held by a researcher for whatever reason. In studying consciousness, it is important to understand the relationship between notions about consciousness and personal beliefs about reality.

Robert Moore and I examined the relationship of notions of consciousness and beliefs about reality in a survey that we carried out in 1986 with 334 participants who could potentially write about consciousness in the academic literature. Using a number of multivariate statistical analyses, we found a material-transcendent dimension underlying beliefs about reality. In the following description of that dimension, I am using the terms that appeared in the questionnaire, with whatever meanings they were taken to have by the respondents. These would not necessarily match the conventional meanings of these terms in philosophy or other disciplines. In fact, we had found in pilot questionnaires that we needed to keep the questionnaire items conceptually simple. Furthermore, the correspondences given in this description are based on statistical averaging and any given individual could well differ from these norms in idiosyncratic ways.

We were able to identify three positions along a material-transcendent dimension: materialism, conservative transcendence, and extraordinary transcendence. Those tending toward materialism believed that the world was a physical place governed by deterministic laws, had physical monist ideas about the mind-body problem, believed in science as a way of acquiring knowledge, and had no religious affiliation. Those tending toward the conservatively transcendent position were characterized by religious beliefs as well as believing that meaning was an important aspect of reality. They were dualists, advocated hermeneutic methodologies, and indicated Christian or

Judaic religious affiliation. Those tending toward the extraordinarily transcendent position believed that they had had experiences that science could not explain, such as out-of-body experiences or mystical experiences. They were mental monists, believed in paranormal means of acquiring knowledge and checked off the box that said “own beliefs” when providing information about religious affiliation.

For materialists, consciousness is just information in an information-processing system, an emergent property of the brain or a computational system, and always characterized by intentionality. In any case, consciousness is just a byproduct of nonconscious physical processes of one sort or another. Those tending toward the conservatively transcendent position like the subjective definitions of consciousness, think that consciousness is evidence of a spiritual dimension within people, and that it gives meaning to reality. Hence consciousness is important for them. For those tending toward the extraordinarily transcendent position, consciousness is all there is. They prefer defining consciousness in the context of altered states of consciousness rather than the ordinary waking state and see consciousness as the key to inner growth while also being the ultimate reality. Upon further statistical analyses, it became apparent that the distinction between notions of consciousness and beliefs about reality was an arbitrary one and at that point these patterns of ideation were simply regarded as beliefs about consciousness and reality (Barušs & Moore, 1989; 1992; Barušs, 1990).

Clearly some of the versions of consciousness and reality found by Moore and myself contradict each other. The tendency might be to say that those with materialist beliefs are “right” while those with transcendent beliefs of any sort are “wrong.” What sort of people would hold such strange beliefs? Well, that is an empirical question that one of my thesis students set out to answer. She gave 75 student volunteers the Beliefs about Consciousness and Reality Questionnaire (BACARQ) derived from the original survey, as well as Jackson’s Personality Research Form — E, which is a measure of personality traits (Jackson, 1999). She found that there was a correlation between transcendence and “understanding,” a personality trait that is characterized by being curious, logical, astute, and so on. Contrary to expectation, students tending toward transcendent beliefs had a more rational approach to reality than students tending toward materialism. And these were unlikely to have been students who were simply trying to please the researchers because of a negative correlation between transcendence and social recognition. In other words, those scoring higher on transcendence were less likely to seek approval of others or care what others thought about them (Jewkes & Barušs, 2000).

The personality trait of understanding is an aspect of the personality trait of openness. And there have been known to have been small correlations between openness and intelligence (as measured by IQ tests), so the question arose of whether there was a correlation between transcendence and intelligence. The research literature concerning unusual beliefs and intelligence is inconsistent with the assumption apparently commonly made that anyone who holds transcendent beliefs is just plain stupid and that if such people had more wits about them they would be materialists. That is an empirical question.

Another of my thesis students investigated the connection between transcendence and intelligence by giving 39 undergraduate students the Beliefs about Consciousness and Reality Questionnaire as well as Jackson’s Multidimensional Aptitude Battery — II, which is a measure

of IQ. All of the relationships that were found indicated that there was a positive correlation between transcendence and intelligence. In particular, Item 9 from the questionnaire, which reads “There is no reality other than the physical universe” had a correlation of  $r = -.48$  ( $p=.002$ ) with Full Scale IQ. In other words, those who were the most intelligent thought that there was more to reality than the physical universe. A scatterplot of the Total Beliefs score on the BACARQ against Performance IQ appeared to show that those with lower IQ tended somewhat toward transcendent beliefs, those with midrange scores on Performance IQ had the least transcendent beliefs, and those with high IQ had the most transcendent beliefs. Indeed, quadratic regression of Total Beliefs scores on Performance IQ had better goodness of fit than linear regression ( $R^2 = .10$  vs.  $R^2 = .02$ ). This prompted a median split at a score of 107 for Performance IQ which resulted in a correlation of  $r = .65$  ( $p = .003$ ) between Total Beliefs and Performance IQ. Given that Performance IQ is conceptualized as a measure of a person’s intellectual agility when encountering novel challenges, it would appear that those with the most transcendent beliefs are also those who are most intellectually able (Lukey & Barušs, 2005).

So what? First, not everyone is a materialist, using the characterization of materialism that arises constructively from the statistical analyses of our questionnaire data. Second, for a small student sample, rejection of materialism is associated with a more rational approach to reality. Third, for an even smaller student sample, rejection of materialism is associated with greater intelligence. So it is okay not to be a materialist. And there are other reasons to open up the beliefs spectrum. For example, materialism cannot explain matter (Barušs, 2007; 2010). What is perhaps germane here is the significance that is given to altered states of consciousness by those who tend toward the extraordinarily transcendent state of consciousness. For them, it is not so much within the ordinary waking state that consciousness reveals itself, but in its alterations. So let us turn to the alterations of consciousness.

## A List of Alterations of Consciousness

Before talking about specific issues that arise from a study of altered states of consciousness, it would be instructive simply to list some of the relevant alterations of consciousness. I use the expression “alteration of consciousness” as a more general term than “altered state of consciousness” (which implies a stable state that is clearly separable from the ordinary waking state along some appropriate dimensions.) The following is a list of alterations of consciousness along with some explanatory notes. Unless indicated otherwise by citations, the material in this list has been taken from my book *Alterations of Consciousness* (Barušs, 2003).

1. the ordinary waking state, daydreaming, absorption, mindfulness
2. sensory restriction
3. sleep, parasomnias
4. hypnagogic and hypnopompic states
5. dreaming, nightmares, dream incubation, lucid dreaming, precognitive dreaming, shared dreaming
6. hypnotic trance, fantasy proneness, trance, dissociated states, dissociative identity disorder, possession, mediumship
7. out-of-body experiences

8. alien abduction experiences
  9. drug-induced states
  10. flow, mystical states, transcendent states, pure consciousness, nondual states, states of no-self
  11. death, impending death states, near-death experiences, shared near-death experiences
  12. putative memories of: pre-birth experiences, previous-lifetime experiences, future lifetime experiences, between-lives experiences
  13. pathological states such as derealization, depersonalization, depression, psychosis, anxiety, the ordinary waking state
- 
1. There are a number of definitions of daydreaming, depending upon the combination of spontaneity, subjectivity, and fancifulness one adopts for one's definition. Usually, one conceptualizes daydreaming as being opposed to focussed thinking. In our Western intellectual tradition, we have epistemically privileged focussed rational thinking in the ordinary waking state, although acknowledging that insights could occur during reverie as described, for example, in Graham Wallas' (1926) description of the four stages of problem solving. Absorption is a focussed state of mind with attenuated self-reflection that can occur by itself or in the context of hypnotic trance, trance, flow, and concentrative styles of meditation. Mindfulness usually refers to sustained monitoring of the events of one's experiential stream and includes disidentification with the contents of mind as well as an attitude of equanimity toward those contents.
  2. Sensory restriction, known previously as sensory deprivation and also called "restricted environmental stimulation technique," refers to the reduction of sensory input. This can be done, for example, by staying in a dark and quiet room, lying in a floatation tank, or by experiencing a uniform sensory field, such as in so-called Ganzfeld experiments.
  3. Sleep is a biologically induced altered state of consciousness. Parasomnias are sleep disorders such as sleep terrors and sleepwalking. Highly complex behaviours can occur during sleepwalking, such as in the case of Kenneth Parks who drove his car to his parents-in-laws' house and killed his mother-in-law while asleep.
  4. Hypnagogic and hypnopompic states are transition states that occur while falling asleep and waking up, respectively, often characterized by vivid imagery. These are sometimes liminal states in which nonconscious material surfaces in awareness.
  5. Dreaming occurs during non-rapid eye movement sleep, during which there is lowered brain metabolism, as well as during rapid eye movement sleep during which brain metabolism is about the same as it is during wakefulness. Nightmares are dysphoric dreams. Lucid dreaming is dreaming in which one knows that one is dreaming; that ability can be deliberately cultivated. Precognitive dreaming entails dreaming about events that occur in the future. Shared dreaming includes both meshing dreams, in which two people dream the same dream contents, and meeting dreams, in which two or more people encounter each other in their dreams. Experimentation with shared dreaming involves becoming lucid while dreaming and then seeking to meet with another lucid dreamer to exchange specific information (Waggoner, 2009). Whereas there is considerable evidence for precognitive dreaming, there is less proof for shared dreaming, although its occurrence appears to be likely.

6. Hypnotic trance is whatever state one enters upon being hypnotized. This is not the same state for everyone but depends upon one's hypnotic susceptibility and the dispositions that allow for such susceptibility. In some cases, such trance is simply compliant behaviour in the ordinary waking state. In other cases, it could be due to fantasy proneness or dissociation. Fantasy proneness refers to a person's ability to imagine something as though it were real, without mistaking the imagined events as being real. Often, hypnotic behaviour is the result of dissociation, whereby there are functional disconnections within a person's psyche. "Trance," in general, is a term used for a number of states in which there is the appearance of the presence of subjective awareness and self-determination, but no significant actual awareness or self-determination. Dissociative identity disorder is a psychiatric disorder in which alternate personas or fragments take turns being that person. Possession refers to states in which a person appears to have been taken over by something other than who that person ostensibly is. There can be confusion between possession and dissociative identity disorder in that possession could simply be the manifestation of a persona derived from that person's psyche or, vice versa, that personas are possessing entities such as deceased relatives, if that is possible. In other cases, it appears that both dissociative identity disorder and possession are occurring within the same body. Mediumship is the ostensible transmission of information or energy from dimensions of reality other than ordinary physical manifestation.

7. Out-of-body experiences are experiences in which a person has a somesthetic sense of being outside of her body, irrespective of whether or not there is any sense in which she is actually outside of her body.

8. Alien abduction experiences are experiences in which a person believes that she has been abducted by aliens and can include feelings of extreme terror, missing time, and bodily scars such as "scoop marks." At present there are no known explanations for these experiences.

9. Psychoactive drugs induce alterations of consciousness to varying degrees. The most interesting of the drug-induced states are those caused by psychedelics such as ayahuasca, dimethyltryptamine, d-lysergic acid diethylamide, psilocybin, and mescaline.

10. Flow is a state of exceptional well-being in which one is absorbed in a challenging activity for which one has the requisite skills. Mystical states are characterized, in brief, by a sense of unity with all that exists, noetic revelation, and joy. Transcendent states are states that are judged to be superior in some sense to the ordinary waking state. Pure consciousness refers to states of consciousness without intentionality, i.e., states of consciousness in which the sense of existence occurs but in which there are no contents of consciousness. Nondual states are states in which the duality between subject and object disappears. And states of no-self are states in which a person's sense of self disappears (e.g., Roberts, 1993).

11. Death is an altered state of consciousness, although it is not clear exactly what sort. Impending death states are states of consciousness close to death in which a person might hallucinate the presence of deceased relatives or other beings. Near-death experiences are reports of experiences in which a person has usually been close to death for some period of time without breathing, heartbeat, or brainwaves. Shared near-death experiences are similar to shared dreams, in that the near-death experience of a person having that experience is shared by a person who is

possibly in the same room but who is not close to death (Moody, 2010).

12. Either spontaneously or through hypnosis, guided imagery, or some other means, people appear to “recall” experiences that occurred before they were born, experiences from apparently previous lifetimes, experiences from “future” lifetimes, or experiences from between lives.

13. Consciousness can also be altered in pathological states such as derealization disorder in which feelings of reality are lost; depersonalization disorder, in which the sense of self is lost; depression, psychosis, and anxiety. And finally, it is not difficult to argue that the ordinary waking state is also a pathological state (cf. Walsh, 1984; Malamud, 1986).

## Feelings of Reality

The first issue that I would like to discuss is concerned with feelings of reality (FORs). Feelings of reality are “how *real* reality feels” qualia. One way to think about them is to consider William James’s notion of a penumbra surrounding a particular thought that creates the context within which that thought occurs (James 1890/1983). The psychological study of experience has largely consisted of the examination of the contents of experience that are the focus of attention and not the context within which they occur. One reason for that is simply that it is more difficult to empirically observe the context, precisely because it is not the focus of attention. This is comparable to the study of dark matter and dark energy whose existence needs to be inferred from the observations of matter that does reflect light (Panek, 2011). One of my thesis students studied FORs of participants in the ordinary waking state, in an imagined near-death experience, and, as recalled in memory from an actual near-death experience. She found that FORs varied across different states of consciousness (Sangster, 2004).

For most people reality feels real. However, there are states of diminished FORs such as those that occur in derealization disorder, in which the events that are going on for a person do not feel as though they were real. This can be a terrifying feeling (American Psychiatric Association, 2000). But FORs can also be enhanced in some altered states of consciousness such as near-death experiences, lucid dreams, alien abduction experiences, and transcendent states. My thesis student found that FORs were clearer, more intense, and more distinguishable in the altered states that she studied compared to the ordinary waking state (Sangster, 2004).

The obvious question is, are feelings of reality a good criterion for what is actually real? If the answer is yes, then some near-death experiences, lucid dreams, alien abduction experiences, and transcendent experiences are more real than ordinary reality. If the answer is no, then the reality of reality must rest on criteria other than FORs. If so, what exactly are they? How is the reality of whatever is going on to be determined? How valid is reliability, for example, as a criterion of what is real? And is there any evidence that the ordinary waking state is epistemically privileged? And if it is not, and we let go of the assumption that what is going on in the ordinary waking state is “real,” then what are we left with?

Why does this matter? Samuel Johnson refuted Bishop Berkeley’s idealism by kicking a large stone (Boswell, 1823). The idea behind this refutation is that no one can deny the objective

solidity of physical manifestation because it feels real. In other words, because feelings of reality are so evident in the ordinary waking state, phenomena in that state must be made out of ontically substantial “things.” Of course, logically, that makes no sense, but I sometimes still hear that sort of “refutation” when the substantiality of matter is challenged.

In a lucid dream, I found myself in a room in a tall building that was indistinguishable from a room in the ordinary waking state of consciousness. Recalling Samuel Johnson’s “argument,” I deliberately walked over to the dream wall and pounded on it with my fist, hard, several times. Yup. It was solid, just like Johnson’s stone. FORs were the same for me in my lucid dream as they would be in my ordinary waking state of consciousness. Upon hearing this story, one of my students repeated my experiment in her lucid dream and also found the walls in her dream to be solid.

However, just because the walls in our dreamscapes were solid, does not mean that they were made out of anything. The feelings of reality in my dream do not allow me to conclude that the wall was made out of “things.” Similarly, just because physical manifestation appears to us to be solid does not mean that it is made out of any “thing.” And, indeed, we know from subatomic physics that elementary particles do not have continuous existence, spatial extension, or stable properties (Kempf, 2008; Kochen & Specker, 1967; Barušs, 2010). In other words, there is *nothing* down there out of which to construct reality. Matter is not made out of *anything*.

So what does this tell us about consciousness? Cutting FORs loose from our assumptions about the nature of reality gives us a greater opportunity to call into question the nature of physical manifestation. Materialist theories of consciousness, such as those proposed by Christof Koch (2012), depend upon the viability of ontologically robust matter, at least at the macroscopic scale. But if we can be so easily mislead about the solidity of the objects of our experience, then how excited should we get about materialist theories that promise to give an account of consciousness in terms of what could end up being as hallucinated as my dream wall?

My example also suggests a way forward for understanding the nature of consciousness. In Tibetan dream yoga, for instance, the idea is to master the dream state. This includes using the will to direct dream events. In my lucid dream, after banging on the wall, I decided to go through the ceiling in order to get to the top of the building. At first I could not, because the ceiling was solid, but because I knew that I was dreaming, I knew that it was just a dream ceiling, and so I kept willing myself to go through it until I successfully penetrated it. The idea is that the insights and skills learned during the dream state can be carried over to the waking state, until the waking state is recognized to be as much a projection of one’s mind as is the dream state (LaBerge & Rheingold, 1990). Then, perhaps when we kick Johnson’s stone, the foot goes through (cf. David-Neel, 1929/1971; Pulos & Richman, 1990; Braude, 2007). If physical manifestation proves to be a projection of the mind, then consciousness is ontologically primary relative to matter. This tells us something about consciousness.

## Anomalous Information Transfer

A common occurrence in alterations of consciousness is the presence of information in places where it should not be. For instance, in experimental studies, mediums were asked to provide information about a person known to the experimenter but whom the mediums had not met. The mediums in those studies got over 80% of the information correct through anomalous means (Schwartz, 2002). My students tell me that they do not care what the empirical research reveals, that they will believe it when they see it.

In response to students' skepticism, I bring to class Angie Aristone, who has worked as a medium and who has been involved in some of my research projects. She often gets specific information about students that she should have no way of knowing. For example, in one case she turned to one student and told her that her mother was one of seven children in the family. She told her several other things, then turned to another student in the class and said that her mother was one of seventeen children in the family. Both numbers were correct. I have also seen her correctly imitate gestures that were made by the deceased while they were alive. For instance, she told one student that his grandfather was telling him to follow his heart and not "this," where "this" referred to a gesture by the medium whereby she held up her hands and flapped her fingers against her thumbs. I turned to the medium with a quizzical expression on my face, unable to understand the intended meaning of the gesture. The student, however, said that that was what his grandfather used to do to indicate that he should not listen to what other people said.

Examples such as these can be evidential for some people (Barušs, 1996). For more robust proof we need scientific studies such as those conducted by Gary Schwartz. But less evidential examples can illustrate characteristics of anomalous phenomena and help to guide research. So here is another example, this time of precognitive dreaming, which does not constitute robust proof, but serves as an illustration of anomalous information transfer.

I had written a book and sent it to several publishers when, on the night of September 14, 2004, I had a dream in which I dreamt that I was sitting in a cafeteria after having bought a lottery ticket. I could see that I had won, even though the ticket was upside down. I wondered if the ticket had expired but when I turned it over I saw that the expiration date was October 17; that the ticket was good. Lottery tickets represent academic publication in my dreams because I think of academic publication as a lottery rather than being merit-based. The ticket being upside down represented the precognitive process itself, in that, in my waking life I did not know that the book would be published; however, I did know that in my dreams. I interpreted the date as the date on which the manuscript would be accepted for publication. Nothing happened on October 17, 2004, but on October 17, 2005, the book was accepted for publication. The date of acceptance had apparently accurately appeared in my dream.

Montague Ullman carried out two studies of precognitive dreaming at the Maimonides Medical Center in 1969 and 1970. Malcolm Bessent was the dreamer in both cases. In the second study, for instance, Bessent was awakened on eight nights for periodic dream reports the night before he experienced a randomly chosen multisensory presentation about a particular theme, and again on the eight nights after he had experienced the presentation. The dreams from the night before

and the night afterwards were compared to the multisensory experience to determine which of them more closely matched the presentation. For seven of the eight nights, the dream contents for the precognitive nights more closely matched the presentation than the dream contents of the subsequent nights. Indeed, in one case, Bessent correctly predicted during his dream reports that the next day's presentation would be about birds, which it was (Ullman & Krippner, 1973). These studies have sometimes been erroneously reported in the secondary literature in such a way as to make it incorrectly appear that the researchers were incompetent (Child, 1985).

The occurrence of anomalous information transfer suggests that thoughts can occur in subjective consciousness<sub>2</sub> that are not the product of sensory input or the brain's own localized activity. Furthermore, these anomalous impressions can refer to events that are temporally displaced from the time of their occurrence. Perhaps subjective consciousness<sub>2</sub> or consciousness<sub>3</sub> are not confined to the skull. Perhaps time is not linear so that the stream of consciousness is only an apparent stream. What is it about reality that allows information from outside one's light cone to nonetheless show up? The fact that events such as these occur, tells us something about what consciousness is like.

## Somatic Plasticity

The third issue I want to address is the extent to which the body can change in unexpected ways. We have the notion that intentions that we have within subjective consciousness<sub>2</sub> can be realized as behaviour. The recurrent example that I have heard at consciousness conferences is that of raising one's arm: I decide to raise my arm and my arm goes up. But there are some unexpected examples of somatic plasticity.

The first example is that of hypnotic analgesia. Simply by inducing a hypnotic trance, it becomes possible to carry out surgery on some people's bodies. An example of this was given by a surgeon who performed liposuction surgery on himself while standing over the course of four hours. What is noteworthy about this case is not only the degree of dissociation that the surgeon was able to induce, but the fact that analgesia was maintained despite the continuous bombardment of cutaneous nerve endings which would ordinarily be experienced as being extremely painful (Botta, 1999). In these cases, there seems to be a nonconscious mechanism that is triggered simply by suggestion, but that has the capacity to block painful sensory input from being experienced as such.

As an extension of cases of hypnotic analgesia, there can be significant physiological changes when a person with dissociative identity disorder switches between alters. Such changes can include changes in handedness, visual acuity, sensitivity to allergens, and responses to medication. For instance, I am aware of two cases in which a person awakened from anaesthesia during surgery when she switched to an alter that had not been anaesthetized. These changes can extend to unusually rapid healing with switches between alters. (Such rapid healing has also been reported in some cases following near-death experiences (Atwater, 2007; 2011; Moorjani, 2012).) What is interesting is the extent to which physiological changes can occur in response to changes in self-identity. Simply by believing oneself to be someone else results in partial physiological adaptation to the altered identity (Barušs, 2003).

There is a whole subdiscipline of psychoneuroimmunology examining connections between the contents of one's experiential stream and the activity of the immune system. For instance, in one of a series of studies, sixteen participants were asked to imagine trauma to their bodies requiring a type of white blood cell known as neutrophils to migrate from the bloodstream to the site of the imagined trauma. Blood was taken before and after the visualization and a 60% decrease in neutrophil counts was found along with decreased neutrophil adherence. It appeared that so many neutrophils had left the bloodstream that the ones remaining to be measured were those with low adherence. In a further study, 27 participants were asked to imagine increasing the adherence of the neutrophils while keeping them in the bloodstream. This time an increase in the adherence of the neutrophils was found. There was also a correlation between neutrophil adherence and the quality of imagery ratings (Schneider, Smith, Minning, Whitcher, & Hermanson, 1990). In this case there was an intention to change the activity of white blood cells and a visualization of the desired changes.

Changes to the right caudate nucleus of the brain were found in nine people whose brains were imaged using positron emission tomography after ten weeks of cognitive-behavioural therapy with a mindfulness component for the successful treatment of obsessive compulsive disorder. The idea here is that mindfulness allowed for disidentification with the usual pathological brain patterns and the intentional redirection of the brain toward healthier functioning in a process of self-directed neuroplasticity (Schwartz, 2005; Schwartz & Begley, 2002; Schwartz, Stapp, & Beauregard, 2005).

In 1979, eight elderly men were taken on a retreat for one week during which time they had to live as if it were 1959. A control group of eight men got to experience the same retreat except that they reminisced about 1959. The participants in the experimental group had greater improvements on joint flexibility, finger length, manual dexterity; higher IQ; better weight, height, gait, and posture than the participants in the control group (Langer, 2009). By pretending that they were twenty years younger, the bodies of the elderly men in the experimental group became functionally younger. In this case there is the deliberate effort at the level of consciousness<sub>2</sub> to act *as if* a counterfactual state of affairs were actual.

If changes such as these can occur in one's body in correspondence with one's own intentions, then the question arises of whether it is possible to affect not only one's own body, but that of someone else. That is an empirical question. I tested it under the rubric of remote healing, i.e., healing someone at a distance. The remote healing literature is mixed, with some studies finding persuasive evidence for it and others failing to do so (e.g., Byrd, 1988; Krippner & Achterberg, 2000; Leibovici, 2001).

My study was done entirely over the Internet. I e-mailed participants indicating the time at which I would begin a session for them and asked them to answer three questions, on a scale of one to

six, indicating whether they experienced anything unusual, whether they were more fatigued than they expected to be, and whether they felt more energized than they expected to be. Then I flipped a coin and if it landed heads I would conduct a remote healing session for them. If it landed tails I did nothing further. In the remote healing sessions I used techniques derived from Matrix Energetics, a system of transformation developed by Richard Bartlett, whereby one essentially imagines alternatives to the occurrent reality (Bartlett, 2007; 2009; Barušs, 2012).

From May 26, 2010 until May 11, 2012 there were 22 participants in the study with a total of 138 sessions — 72 of which were experimental and 66 control. There were one to eleven sessions per participant with a median of seven. The average length of sessions was 22 minutes (with a standard deviation of 8 minutes). In each case, the means for the sessions in the experimental sessions were numerically greater than the means for the control sessions. The absolute value of the difference between being more energized and more fatigued was not only numerically greater for the experimental condition (with a mean of 2.08 and standard deviation of 1.58) than the control condition (with a mean of 1.56 and a standard deviation of 1.59) but statistically significantly greater at  $p = .04$  (one-tailed). This did not surprise me, given that the written reports that I had received from participants indicated changes in energy and, often, enhanced concentration and feelings of well-being, at the time of an actual session. So, in the case of remote healing, there were changes to other people's self-reported energy levels corresponding to my healing intention and visualization of changes for them.

And so, events occurring during hypnotic trance, absorption, dissociated states, mindfulness, behaving *as if*, and remote healing, suggest that somatic events can coincide with changes in subjective consciousness<sub>2</sub>. Can mental events *cause* changes to one's own or someone else's physical body? Can mental events *cause* the brain to change? Is consciousness ontologically primary? Is the brain a byproduct of consciousness<sub>3</sub>? Does the sense of existence bring in the specifics of manifestation, including physical manifestation? I do not know the answers to those questions. I suspect that they are "yes" (Barušs, 2009; 2010). But at the least, by opening the door of what goes on in altered states of consciousness, we can learn something about what we can and cannot say about consciousness.

I want to make it clear that I am not asking anyone to believe anything that I say. Knowledge is not based on belief, but on appropriate empirical research (Barušs, 1996). It is important to read the primary literature and to visit the laboratories doing the research reported in this paper. Or better yet, the reader can set up her own experiments to determine the truth of the matter.

### **Author Note**

This paper is based on a talk given during the California Cognitive Science Conference on April 28, 2012 at the University of California Berkeley. I thank my research assistants Carolyn van Lier for tracking down information that was used in this paper, Monika Mandoki for providing me with feedback, and Shannon Foskett for providing feedback, editing, and proofreading the manuscript. I also thank King's University College and Medical Technology (W.B.) Inc. for financial support that enabled the research that was reported in this paper as well as assistance with its preparation.

## References

- American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed. text revision). Washington, DC: Author.
- Atwater, P. M. H. (2007). *The big book of near-death experiences: The ultimate guide to what happens when we die*. Charlottesville, Virginia: Hampton Roads.
- Atwater, P. M. H. (2011). *Near-death experiences: The rest of the story: What they teach us about living, dying, and our true purpose*. Charlottesville, Virginia: Hampton Roads.
- Bartlett, R. (2007). *Matrix energetics: The science and art of transformation*. New York: Atria.
- Bartlett, R. (2009). *The physics of miracles: Tapping into the field of consciousness potential*. New York: Atria.
- Barušs, I. (1987). Metanalysis of definitions of consciousness. *Imagination, Cognition and Personality*, 6(4), 321-329.
- Barušs, I. (1990). *The personal nature of notions of consciousness: A theoretical and empirical examination of the role of the personal in the understanding of consciousness*. Lanham, Maryland: University Press of America.
- Barušs, I. (1992). [Review of *A cognitive theory of consciousness* by B. Baars]. *Imagination, Cognition and Personality*, 11(3), 303-307.
- Barušs, I. (1996). *Authentic knowing: The convergence of science and spiritual aspiration*. West Lafayette, Indiana: Purdue University Press.
- Barušs, I. (2003). *Alterations of consciousness: An empirical analysis for social scientists*. Washington, DC: American Psychological Association.
- Barušs, I. (2007). *Science as a spiritual practice*. Exeter, UK: Imprint Academic.
- Barušs, I. (2008). Beliefs about consciousness and reality: Clarification of the confusion concerning consciousness. *Journal of Consciousness Studies*, 15(10-11), 277-292.
- Barušs, I. (2009). Speculations about the direct effects of intention on physical manifestation. *Journal of Cosmology*, 3, 590-599.
- Barušs, I. (2010). Beyond scientific materialism: Toward a transcendent theory of consciousness. *Journal of Consciousness Studies*, 17(7-8), 213-231.
- Barušs, I. (2012). [Review of *Matrix energetics: The science and art of transformation* and *The physics of miracles: Tapping into the field of consciousness potential* by Richard Bartlett]. *Journal of Scientific Exploration*, 26(1), 169-176.
- Barušs, I. & Moore, R. J. (1989). Notions of consciousness and reality. In J. E. Shorr, P. Robin, J. A. Connella and M. Wolpin (Eds.), *Imagery: Current perspectives* (pp. 87-92). New York: Plenum.
- Barušs, I. & Moore, R. J. (1992). Measurement of beliefs about consciousness and reality. *Psychological Reports*, 71, 59-64.
- Boswell, J. (1823). *The life of Samuel Johnson, LL.D.* London: J. Richardson and Co.
- Botta, S. A. (1999). Self-hypnosis as anesthesia for liposuction surgery. *American Journal of Clinical Hypnosis*, 41(4), 299-301.
- Braude, S. E. (2007). *The gold leaf lady and other parapsychological investigations*. Chicago: The University of Chicago Press.
- Byrd, R. C. (1988). Positive therapeutic effects of intercessory prayer in a coronary care unit population. *Southern Medical Journal*, 81(7), 826-829.
- Child, I. L. (1985). Psychology and anomalous observations: The question of ESP in dreams. *American Psychologist*, 40(11), 1219-1230.
- David-Neel, A. (1971). *Magic and mystery in Tibet*. New York: Dover. (Original work published 1929 in French)
- Dennett, D. C. (1978). *Brainstorms: Philosophical essays on mind and psychology*. Montgomery, VT: Bradford.
- Jackson, D. N. (1999). *Personality research form manual* (3rd ed.). Port Huron, MI: Sigma Assessment

- Systems.
- James, W. (1904). Does "consciousness" exist? *The Journal of Philosophy, Psychology and Scientific Methods*, 1(18), 477–491.
- James, W. (1983). *The principles of psychology*. Cambridge, MA: Harvard University Press. (Original work published 1890)
- Jewkes, S. & Barušs, I. (2000). Personality correlates of beliefs about consciousness and reality. *Advanced Development: A Journal on Adult Giftedness*, 9, 91-103.
- Kempf, A. (2008). Applied Mathematics 872: Quantum field theory for cosmology: Lecture notes. University of Waterloo, Waterloo, Canada.
- Koch, C. (2012). *The neurobiology of consciousness*. California Cognitive Science Conference, University of California Berkeley, April 28, 2012.
- Kochen, S. & Specker, E. P. (1967). The problem of hidden variables in quantum mechanics. *Journal of Mathematics and Mechanics*, 17(1), 59–87.
- Krippner, S., & Achterberg, J. (2000). Anomalous healing experiences. *Varieties of anomalous experience: Examining the scientific evidence* (pp. 353–395). Washington, DC: American Psychological Association.
- LaBerge, S. & Rheingold, H. (1990). *Exploring the world of lucid dreaming*. New York: Ballantine.
- Langer, E. (2009). *Counter clockwise: Mindful health and the power of possibility*. New York: Ballentine.
- Leibovici, L. (2001). Effects of remote, retroactive intercessory prayer on outcomes in patients with bloodstream infection: Randomised controlled trial. *British Medical Journal*, 323(7327), 1450–1451.
- Lukey, N. & Barušs, I. (2005). Intelligence correlates of transcendent beliefs: A preliminary study. *Imagination, Cognition and Personality*, 24(3), 259–270.
- Malamud, J. R. (1986). Becoming lucid in dreams and waking life. In B. B. Wolman & M. Ullman (Eds.), *Handbook of states of consciousness* (pp. 590-612). New York: Van Nostrand Reinhold.
- Moody, R., Jr. (with Perry, P.). (2010). *Glimpses of eternity: Sharing a loved one's passage from this life to the next*. New York: Guideposts.
- Moorjani, A. (2012). *Dying to be me: My journey from cancer, to near death, to true healing*. Carlsbad, CA: Hay House.
- Panek, R. (2011). *The 4 percent universe: Dark matter, dark energy, and the race to discover the rest of reality*. Boston, MA: Houghton Mifflin Harcourt.
- Pulos, L. & Richman, G. (1990). *Miracles & other realities*. Vancouver, Canada: Omega.
- Roberts, B. (1993). *The experience of no-self: A contemplative journey* (Rev. ed.). Albany, NY: State University of New York Press.
- Sangster, L. T. (2004). *Characterizing feelings of reality*. Bachelor's thesis, University of Western Ontario, London, Ontario, Canada.
- Schneider, J., Smith, C. W., Minning, C., Whitcher, S. & Hermanson, J. (1990). Guided imagery and immune system function in normal subjects: A summary of research findings. In R. G. Kunzendorf (Ed.), *Mental imagery* (pp. 179–191). New York: Plenum.
- Schwartz, G. E. (with Simon, W. L.). (2002). *The afterlife experiments: Breakthrough scientific evidence of life after death*. New York: Pocket.
- Schwartz, J. M. (2005). Mental health, spiritual information, and the power of the mind to shape the brain. In C. L. Harper, Jr. (Ed.), *Spiritual information* (pp. 389-394). Philadelphia: Templeton Foundation Press.
- Schwartz, J. M., & Begley, S. (2002). *The Mind and the brain: Neuroplasticity and the power of mental force*. New York: ReganBooks.
- Schwartz, J. M., Stapp, H. P., & Beauregard, M. (2005). Quantum physics in neuroscience and psychology: A neurophysical model of mind-brain interaction. *Philosophical Transactions of the Royal Society B*, 360, pp. 1309–1327.
- Ullman, M., & Krippner, S. (with Vaughan, A.). (1973). *Dream telepathy*. New York: Macmillan.
- Waggoner, R. (2009). *Lucid dreaming: Gateway to the inner self*. Needham, MA: Moment Point.

- Wallas, G. (1926). *The art of thought*. New York: Harcourt, Brace.  
Walsh, R. (1984). Journey beyond belief. *Journal of Humanistic Psychology*, 24(2), 30-65.