

## The Brain's Default Network and Meditation

Brain imaging studies have recently identified a network of brain areas and their associated functions that have been named the default network. This network has been labeled default because it seems to be responsible for most brain activity taking place when one is not specifically engaged with the external world. It would appear that engagement with the external environment must draw largely upon other brain areas and those areas represents another brain network, which to my knowledge has not been labeled. For simplicity's sake let's hereafter just refer to these as the Externalizing Network (ExN) and the Internalizing Network (InN) see Figure at end. We are all familiar with the notion of left brain and right brain functions but apparently there is another "divide" along the lines of an externalizing brain and an internalizing brain. As with the left and right brain concept, the internalizing and externalizing brain concept does not necessarily mean exclusive functions in all instances. For example, both networks need access to memory in order to function but use it in different ways.

The ExN appears to engage those areas of the brain that govern executive functions in the brain such as focus of attention, problem solving and working memory. It also accesses knowledge and skills that you have acquired for engaging the external environment. It exercises control over motor functions needed to engage the environment through communication and physical actions as well. If you're trying to figure out how to get a potential customer to buy an item that you're offering for purchase, the ExN is engaged. If you're trying to learn how to solve quadratic equations, the ExN is engaged. If you're trying to teach a child to read, the ExN is engaged. However, when such specific activity comes to an end, the InN is automatically engaged.

The InN is developmental and is weakly established in young children. Because the InN is responsible for self-reflective abilities, it can be thought of as the creator of self or ego. Thus, young children have a weakly developed sense of self and are less egocentric than are older children and adults. One might go so far as to suggest that consciousness in young children is less localized and therefore more resonate with non-local consciousness or the unified field of consciousness. Perhaps this is what Jesus had in mind when he said, "*Verily I say unto you, Except ye be converted, and become as little children, ye shall not enter into the kingdom of heaven.*" In other words, you cannot access non-local consciousness unless you can stand aside from the work of the InN and return to a less localized manifestation of consciousness.

The InN creates and maintains our personal narrative (fictive self), simulations, plans, fantasies, ruminations, dreams and such articulated from one's store of memories. The InN is also responsible for the stream of consciousness or "self-talk" that dominates your awareness when the ExN is not engaged. Clearly, if you're doing nothing but sitting

staring out a window, the InN will engage. However, the InN can be brought online, so to speak, when you're engaged in routine activities that don't require focused engagement with the external environment such as running on a treadmill or driving down a long empty stretch of road. Even when external focus may be needed boredom can result in inattention and defaulting to the InN. Where the ExN is more analytical and rational, the InN is more metaphorical and imaginative and creative insights can arise from the operation of the InN.

One personal activity that immediately came to mind while reading several research studies related to the InN was meditation. When one sits to "practice" meditation, two things immediately happen. First, the ExN is disengaged and, second, the InN is engaged. These are operations that most of us easily do with hardly a thought. However, the purpose of meditation cannot be to simply engage the InN, because if that were true, then there would be no difference between meditation and daydreaming. So, the question arises, what is the relationship between the InN and meditation?

Many meditation teachers advocate for the practice of attentional or mindfulness meditation. Attentional or mindfulness meditation is usually described as concentrating on a specific focus such as a rhythmic function like the breath, an auditory stimulus or a visual stimulus. The nature of the auditory or visual stimulus suggested will vary depending upon the tradition from which the suggestion is coming, but there is no evidence that I am aware of from brain imaging studies indicating any functional difference between the effects of different stimuli from different traditions, in spite of claims to the contrary. For example, if the focus is on a sound such as "Aum" or "Amen," then during attentional meditation one simply uses this sound either vocalized or sub-vocalized as a focus and whenever one recognizes that the focus of attention has drifted, the instruction is to simply mentally note the deviation and return to the focus. It seems that the basic process in this form of meditation is to learn to use a solitary focus of attention to avoid engaging the ExN and to avoid becoming entangled in the activity of the InN, while at the same time observing it running in the background, so to speak. It has been said that the function of the mind is to generate thoughts just as the function of the heart is to pump blood. If that is so, it is the InN that is largely responsible for generating the thoughts.

It has been said that attentional meditation is meditation on training wheels. If this is so, then it would seem that insight meditation is the actual goal of one's meditation practice. The transition from attentional to insight meditation is not a sharp or clear transition. However, at some point the process of noting the activity generated by the InN and then standing aside from it begins to develop into an intuitive understanding of the conditioned nature of that aspect of consciousness we call the self. With this intuitive insight comes realization and identification with the Self that has been standing aside and observing the operation of the process that creates the "fictive or biographical self"

or illusion of self that we refer to as "me."

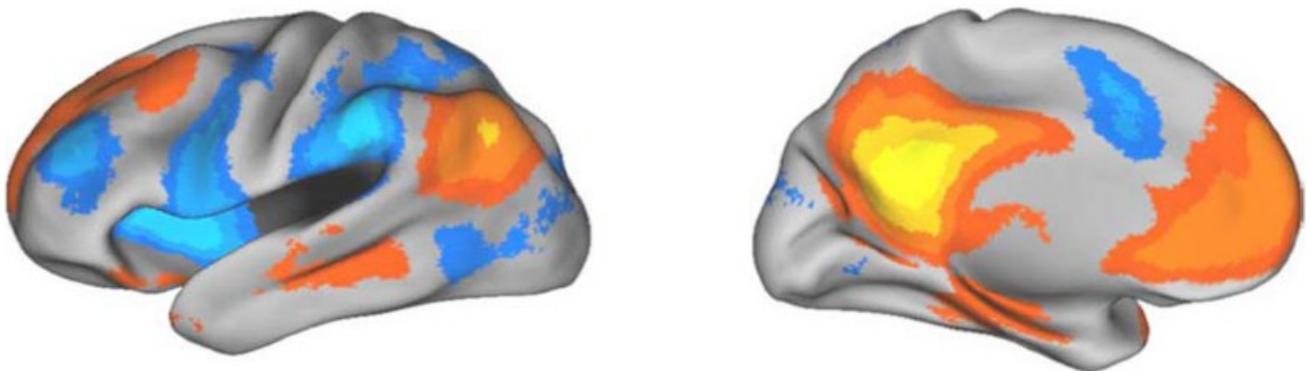
*"The illusion of permanent self dissolving as awareness penetrates and knows the illusion. Moving deeper, beyond the small self, beyond aversion and attachment, beyond ignorance."* Barbara Brodsky and John Orr (meditation teachers).

This intuitive understanding and identification with the greater Self is described by many as a merger with the divine, becoming unified with God or recognition of the unity of All That Is.

There is one practice that is worth mentioning separately because it may illustrate the combination of the two types of meditation. This is the use by one school of Zen meditation of what is known as a koan. A koan is a riddle that is used as the focus of meditation. For example, the widely quoted koan, "What is the sound of one hand clapping?" In light of the InN, it seems that the purpose of a koan is to occupy the InN with an intellectual conundrum that has no solution. This not only serves as a focus but also exhausts the InN's efforts to bring rational understanding to the conundrum. At the point of exhaustion one might say rationality implodes, leaving what Zen refers to as "no mind" or, according to the Hindu sage Pantanjali, puts one beyond words and concepts. In short, the effect is a silencing of the InN's incessant chatter. The American mystic Franklin Merrill-Wolf describes this state as *consciousness without an object*.

Thus, it would seem that if one can learn to stand aside from both the ExN and the InN, then consciousness becomes divorced, albeit temporarily, from the material vehicle that it has previously been imprinted upon and bound to. With this liberation comes realization of one's true nature and liberation from the tyranny of the ego.

David B. Center, PhD



Two views of the brain with the InN in blue and the ExN in orange and yellow.