# Aff Card Doc---Herb---Round 6

## Buddhism K

### 1AR---AT: Neuroplasticity

#### Their ballot key warrant relies on neuroplasticity and describes changes to the brain as a long-term process---proves other rounds and life outside of debate thump. MSU is blue.

Long ’21 [William; 2021; Professor of Political Science at Georgia State University; A Buddhist Approach to International Relations, “A Buddhist Alternative,” Ch. 6]

In addition to revolutionary changes in the physical sciences, the life sciences too have made remarkable new discoveries that challenge our thinking about human nature as irreversibly self-interested and expand the possibilities for considering our cooperative potential and corresponding social arrangements. Until relatively recently, the prevailing view in neuroscience was that the brain contained all its neurons at birth, and the number and circuitry of these neurons were set within the first few years of life. Scientists believed that the only lifelong brain changes were minor alterations in synaptic (interneuronal) connections and accelerating cell death with aging. Social scientists in the Western tradition assumed that this relatively fixed brain was, by nature, first and always primarily self-interested and self-serving.

In the 1990s, however, neuroscientists discovered that the brain continues to generate new neurons throughout life (neurogenesis) and that new and existing neurons undergo structural and functional changes in their circuitry in response to their environments, by training and experience (neuroplasticity). Contrary to what was once believed, the brain is highly dynamic (Eriksson et al. 1998). When referring to changes in the brain, it is important to distinguish between gross morphology and cellular structure and function. The overall structure and pattern of brain development is under genetic control and does not change markedly. But our 35,000 genes are not up to the job of prescribing the wiring for the brain’s 100 trillion or more synapses. These connections are shaped by our ongoing experiences. It is at this cellular level that the brain is remarkably plastic. Neuroplasticity refers to altering connections in the brain, the strengthening, withering, or rerouting of synaptic connections.

Neuroplasticity is more than mere learning or storing a memory. The brain is far more flexible than that. It can make wholesale topographical reorganizations throughout life (Elbert et al. 1995). For example, experiments demonstrate that some brain areas that were thought to be “hardwired” for one function can in response to injury and adaptive effort, take on a totally different function, what scientists call cross-modal functional plasticity. Altering connections in the brain in a way that strengthens the efficacy of a neuronal circuit over the long term is the essence of neuroplasticity.

How does the brain accomplish these adaptive feats? Various new technologies are giving us a glimpse of this process. These new technologies are illuminating the neural correlates for specific adaptations wrought through repeated experiences. These technologies can also show us the brain areas and patterns of electrochemical activation associated with a mental process. In discovering and observing the link between brain circuitry and mental states, some scientists are also suggesting that the causal connection between brain and mind works in both directions (Lutz et al. 2004). Specifically, they offer intriguing new evidence to suggest that the processes of brain wiring and rewiring may be shaped by mental (nonphysical) events. This work reveals that it is not just experience that molds the brain. Rather, changes in brain circuitry are generated only when behavior is specifically attended to. Attention (mindfulness), is required for use-dependent brain changes. In fact, imagined physical movements, if repeated with concentration, can produce the same synaptic changes as actual repetitive body movements (Schwartz and Begley 2002; Slotnick 2004). Similarly, mental imagery correlates with the activation of the same brain areas as those associated with the actual perception of the imagined object. In short, mental force appears to express itself through the brain, but it is not reducible to the brain.

Some neuroscientists began looking at the brain activity (“brain state”) and cognitive and neural characteristics (“brain traits”) of meditators to better understand the immediate and long-term effects of focused awareness. These studies produced preliminary evidence for the possibility that mental training may alter brain activity, shape the physical brain, and affect human behavior. Early work by Richard Davidson, Antoine Lutz, and others found that sustained thoughts activated certain neuronal pathways in the brain associated with the regulation of positive affect (like compassion), reduced negative thoughts and feelings such as anxiety and depression, and subdued self-referential thoughts (See Davidson et al. 2003; Pollard 2003; Lutz et al. 2004). These early studies lent support to the notion that a willful refocusing of mental awareness could bring about important changes in brain activity and structure (Brefczynski-Lewis et al. 2007; Lazar et al. 2005).

These initial investigations have led to hundreds of recent studies on the impact of various forms of mindfulness and meditation on brain functioning and morphology. Two “metastudies” (studies of studies) reviewed these experiments looking for methodological reliable and comparable results. One of these metastudies concluded “that meditation appears to be reliably associated with altered anatomical structure in several brain regions” (Fox et al. 2014 at p. 69). The brains of meditators were altered in eight brain regions including areas related to meta awareness (our ability to watch our own minds), body awareness, memory consolidation and reconsolidation, self and emotional regulation, and infra and interhemispheric communication (Fox et al. 2014; see also Afonso et al. 2020). The second metastudy concluded that meditation produces positive effects on cognitive and emotional processes (Sedlmeier et al. 2012). Several individual studies raise intriguing possibilities. For example, one study found that meditators, unlike control subjects, had reduced activity in “self-referential processing,” i.e., mind wandering, which appears to be our default mechanism and is often correlated with unhappiness (Brewer et al. 2011). Another study found that meditation increased compassionate responses to suffering, even in the face of social pressures to avoid so doing (Condon et al. 2013).

As noted, these changes in brain function and form do not occur without sustained and repeated effort, however. Absent focused attention, the brain will produce predictable patterns of brain activity, that is, our default mode of thinking. Through choice and willful attention, however, it appears that an alternative synaptic path may be activated and perpetuated. The idea that immaterial forces such as intention and attention could shape the brain’s function and form runs counter to classical materialist science. Working in the materialist tradition, most scientists, including almost all neuroscientists, have assumed that mental processes are inefficacious byproducts of purely physical brain processes. To the extent that one can recognize the mind at all, brain to mind is a one-way street. All our thoughts and actions are reducible to impersonal, microscopic, physical processes. Nothing that is nonphysical, such as the mind, consciousness, or will, can even exist in the sense of being a measurable, real entity much less shape physical outcomes.

This classical approach has been unable to explain how brain activity gives rise to consciousness (subjectively felt mental states), however, and what role consciousness might play in the brain’s workings. Why, if exclusively local physical processes in the brain control us, do we possess a stream of conscious thoughts capable of understanding large-scale phenomena? After 350 years of classical material science and more than half a century of neuroscience, materialist approaches have done a good job of linking structure and function in the brain, but have made no progress in explaining consciousness, something we all experience most all the time. In the materialist paradigm, accounting for consciousness is the “hard problem,” and because consciousness cannot be effectively explained by reference to material forces, for most scientists in the classical material tradition, consciousness either is not a legitimate area of inquiry or, if it is, they have promised, since the eighteenth century, that a materialist answer to the hard problem of consciousness is only a matter of time (Araujo 2012).

The idea that the process of brain wiring and rewiring is shaped by immaterial mental events may confound classical materialist science (which either denies mind or separates mind from matter), but it is not inconsistent with quantum science (which sees mind and matter as inextricably entwined). Recall that in the quantum world, the subject determines which of many possible realities becomes actualized through its intention and attention. Quantum theory reunites consciousness with the causal structure of nature, joining subjective experience and objective outcomes. Thus, quantum theory creates a “causal opening for the mind,” a point of entry by which mind could alter the functioning and shape the physical structure of the brain.

Is there evidence for the existence of a “quantum brain” or “quantum consciousness?” At this point we do not know, and it remains to be seen where, if anywhere, there exists a demonstrable locus for quantum effects in the brain. Because the environment for sustained quantum effects to operate in the brain has not been sufficiently established, traditional neuroscience argues that brain functions can, indeed must, be understood as the interactions of neurons operating under classical physical principles. Still, we know that quantum physics operates sub-atomically everywhere, and we know that mechanical explanations of neuronal function cannot account for the processing speed of the human brain. Furthermore, there is evidence that sustained thought alters brain states and traits; we just do not know how or precisely where this occurs. Quantum theory raises the following question to material neuroscience: How can the mind and consciousness be reduced to the function of atoms within the brain if we know that ultimately these atoms have no fixed or non-probabilistic existence outside of subjective mental events? If atoms derive their properties from interaction with consciousness [in quantum], how can consciousness depend only on those same atoms? (Schwartz and Begley 2002).

In truth, at this moment, both materialism and quantum approaches toward mind are meta-physical assertions awaiting more evidence, an epistemic exercise. Science should be about epistemic pursuits, not metaphysical closure, so let us keep an open mind. Asserting that a nonmaterial force (thought) can shape a material object such as the brain, as quantum theory does, is no more speculative than asserting a material basis for nonmaterial consciousness, which is the prevailing materialist neuroscience view. With the advent of quantum theory, the nature of matter has become as problematic as the nature of mind.

Implications of New Scientific Discoveries for Social Theory

I only report on this ongoing scientific debate to consider its possible implications for the discussion at hand. As noted, some social scientists wonder “Are Buddhist ideas harmonious with science?” The answer, I suggest, is “yes,” they are remarkably consistent with the latest findings in the physical and biological sciences, not “otherworldly.”

Coming back to the focus of this discussion (and firmer footing for the author), the quantum explanations for brain plasticity and a causal role for mind carry potentially important behavioral and moral consequences for social thought and action coming from the world of science (Wendt 2015). If true, they would imply that, although we are endowed with a given brain morphology and basic circuitry, not all aspects of our responses are passively determined by neurobiological mechanisms. Instead, our volitional choices moment to moment to attend to one bit of environmental stimulation over another and to form, through our intention and attention (the driving force of karma, for Buddhists), one thought pattern rather than another, can sculpt our brain and make us who we are.