

7 Support from Contemporary Psychology

A great deal has happened in psychology since the time of William James. However, many psychologists, neuroscientists, and philosophers who intended to stay in tune with the basic precepts of physics became locked to the ideas of nineteenth century physicists and failed to acknowledge or recognize the jettisoning by twentieth century physicists of classical materialism and the principle of the causal closure of the physical. Thus while the physicists were bringing effects attributed to the conscious intentions of human agents into the dynamical description of the physically described world, mainline psychologists, embracing behaviorism, sought to remove such features even from psychology, and most philosophers of mind followed suit.

The eventual failure of the behaviorist program to account for the facts of human behavior, and in particular for linguistic behavior, led to the rehabilitation of ‘attention’ during the 1950s, and many hundreds of experiments have been performed during the past fifty years for the purpose of investigating empirically those aspects of human behavior that we ordinarily link to our consciousness. So we can now inquire: How well does the above-described quantum-theory-based approach to mind–brain dynamics square with these newer data?

Harold Pashler’s 1998 book *The Psychology of Attention* describes a great deal of this empirical work, as well as the intertwined theoretical efforts to understand the nature of an information-processing system that could account for the fine details of the empirical data. Two key concepts are the notions of ‘attention’ and of a processing ‘capacity’. The former is associated with an internally directed selection between different possible allocations of the available processing ‘capacity’. A third concept is ‘effort’, which is empirically linked to incentives, and to reports by subjects of ‘trying harder’. Effort increases the portion of the processing capacity that is being applied to a cognitively directed task.

Pashler organizes his discussion by separating perceptual processing from post-perceptual processing. The former covers processing that,

first of all, identifies such basic physical properties of stimuli as location, color, loudness, and pitch, and, secondly, identifies stimuli in terms of categories of meaning. The post-perceptual process covers the tasks of producing motor actions and cognitive action beyond mere categorical identification. Pashler emphasizes (p. 33) that “the empirical findings of attention studies specifically argue for a distinction between perceptual limitations and more central limitations involved in thought and the planning of action”. The existence of these two different processes, with different characteristics, is a principal theme of Pashler’s book (pp. 33, 263, 293, 317, 404)

Orthodox quantum theory also features two separate processes. Quantum theory, applied to the mind–brain system, in accordance with von Neumann’s formulation, involves, first, the unconscious mechanical brain process called process 2. A huge industry has developed that traces these essentially classically describable processes in the brain. But, according to orthodox contemporary physics, another process, von Neumann’s process 1, must also enter into the causal structure. Its physical effects can become manifest in connection with an impulsive feeling described as ‘effort’. The effect of this ‘effort of attention’ is to inject into brain activity, and thence eventually into overt behavior, effects of *intentional inputs*.

Two kinds of process 1 actions are possible. One kind would be determined by brain activity alone. It would be the kind of action associated with James’s assertion that “no object can catch our attention except by the neural machinery”. However, another kind of process 1 action is possible within the framework provided by von Neumann’s formulation. It can stem from a *positive evaluation* based on the felt or experiential quality of internal coherence, and would tend to make the process 1 psychophysical event in which it occurs immediately repeat itself a short time later, with the rapidity of these repeated actions being increasable, *up to a certain limit*, by an experienced quality of the event called ‘effort’. Such a process 1 action could, within the orthodox quantum framework, induce a rapid sequence of similar actions that could activate a quantum Zeno effect that would effectively inject a rapid sequence of mental intentions into the course of brain activity.

This quantum conceptualization of the action of mind on brain is, as we shall now see, in good accord with the *details* of the data described by Pashler. Those data did not necessarily – *from non-quantum considerations* – need to have the detailed structure that it is empirically found to have. Indeed, the various classical-type theories examined by Pashler did not entail it. Consequently, these data provides some em-