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How Literature Plays with the Brain: The Neuroscience of Reading and Art

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Reviews

How Literature Plays with the Brain: The Neuroscience of Reading and Art, by Paul B. Armstrong; 221 pp. Baltimore: Johns Hopkins University Press, 2013.

WHAT GIVES PARTICULAR OBJECTS and performances the qualities that lead to their categorization as “art”? In literary studies, recent theoretical approaches that emphasize sociocultural context have dampened enthusiasm for inquiry into the aesthetic, not simply directing attention elsewhere but frequently asserting that the entire category is the constructed handmaiden of sociopolitical power. But this decades-long eschewal of the aesthetic has perhaps had its day. In *How Literature Plays with the Brain: The Neuroscience of Reading and Art*, Paul B. Armstrong notes this neglect and proposes that neuroscience offers some important insights into aesthetic activity.

The goal of Armstrong’s book is to demonstrate the correlation between aesthetic activity and brain structure and function. Relating this goal in his introductory chapter, Armstrong notes—in a nod to Norman Holland, one of the fathers of cognitive literary studies—that the significant explanatory gap between neuroscience and literary analytical practices limits the former as an interpretive tool. Nevertheless, in Armstrong’s view, neuroscience is far enough advanced for scholars to draw inferences about the literary reading process. Moreover, the new field of neurophenomenology is continuous with the speculative tradition of Continental phenomenology and with reader response theory, fields to which Armstrong links his observations through the book. In his words, “the correlations between neural and phenomenological accounts of the temporality of cognition as nonlinear, horizontal, and reciprocal have important parallels not only in Heidegger’s description of the hermeneutic circle as a structure of anticipation but also in Iser’s conception of reading as a to-and-fro process of consistency building” (p. 21).

Armstrong posits that, while the aesthetic tradition has often, contradictorily, sought the essence of art in harmony on the one hand and disunity on the other, the interplay between harmony and disunity is at the core of aesthetic response. Because it emphasizes the brain’s fundamental plasticity, in Armstrong’s view,

neuroscience confirms the insights of phenomenology and the psychological tradition of William James.

Thus, in chapters two through four, Armstrong ties findings about cognitive and perceptual functions to the concept of play, broadly conceived. Noting at the outset that reading is not directly linked to perception (sight or hearing), Armstrong reviews research on reading and language, demonstrating that language processing is not on the whole a localized activity. Following neuroscientists including Francisco Varela and Stanislas Dehaene, Armstrong promotes the notion of a highly plastic, or “bushy,” brain with many connections between diverse areas and much flexibility of function. Sensibly inferring from this that “a ‘bushy,’ decentered brain would not be likely to have aesthetic experiences located in only one area of the cortex,” Armstrong supports his claim with neuroimaging studies (p. 42). Following contemporary work in neuroaesthetics as well in insisting that aesthetic processing is not categorically distinct from other kinds of processing, Armstrong speculates that “the ways in which art’s harmonies reinforce or rewire neuronal assemblies may have a distinct impact on modes of perception and cognition in everyday life” (p. 47).

In this manner, Armstrong moves from the complexity and plasticity of brain processes to inferences about aesthetic function. Thus, the “to-and-fro process of consistency building” mirrors the functionality of the brain. For instance, distinct brain areas process different aspects of vision (immediate stimulus, orientation, shape, and color), and this fact, along with the evidence of optical illusions and experiments in word recognition, points to the interplay between perception and cognition that constitutes seeing. The evidence that the brain is open to ambiguity and plays with divergent syntheses of visual information harmonizes with Elkhonon Goldberg’s research on novelty, which suggests that cortical areas dedicated to routine and to open-ended operations are simultaneously activated in the experience of novelty.

From this, Armstrong surmises that art and the aesthetic break predictability by engaging in a to-and-fro of routine and novelty. Extending this argument further, Armstrong claims that the brain’s temporality is connected to the capacity for play. Rather than experiencing life as sequential moments, humans are future directed and engage in “perceptual framing,” that is, erasing temporal differences in what they experience as discrete episodes. Armstrong connects perceptual framing with Husserl’s notion of protentional and retentional horizons, the bounded conceptualizations of past and present used to frame and organize experience. Furthermore, Armstrong points out that this experience of temporality, and particularly its bias to the future, coheres with Antonio Damasio’s “as if” body loop, which explains how, through emotional priming, specifically imaginative responses can occur.

Armstrong’s final chapter reviews research on human social responsiveness and on the controversies surrounding it, including theory of mind, simulation theory, and mirror neuron theory. He reminds us that reading is action,

simulated through “as if” experience, and originating in the strong capacity for imitation that begins in childhood. The to-and-fro that takes place in the brain, then, is consistent with the concept of language as a form of action that supports the social functions of mimesis: “The temporality of language and the temporality of original experience can play off each other ... because they are different modes of action” (p. 154).

In stressing that imaginative experience is dynamic action seemingly constituted in brain processes that are in many respects similar to those of direct experience, Armstrong has embarked on a model of aesthetic understanding that gives the arts a central role in human existence. Armstrong legitimately notes that cognitive literary criticism has thus far made little use of neuroscience, and his clear and organized presentation of the scientific material throughout the book provides readers with a coherent guide to the current research relevant to aesthetic experience. Like G. Gabrielle Starr’s *Feeling Beauty: The Neuroscience of Aesthetic Experience*, Armstrong’s book is quite different from traditional literary critical fare, with its twin emphases on textual interpretation and literary history. He manages to negotiate the explanatory gap between discrete scientific findings and theoretical claims with clarity and tact, and, given the infancy of neuroaesthetics, his circumspect avoidance of sweeping connections between brain processes and interpretive acts is wise.

Armstrong might underscore the importance of his book by extending its insights in a few additional directions. For instance, a historical discussion of the emergence of phenomenology and, further, of its relation to American pragmatism—which grew directly out of evolutionary and scientific thinking—would clarify the justification for an emphasis on philosophy in an otherwise scientifically oriented book. Indeed, given his explicit (and accurate) recognition of the impact of William James on subsequent academic psychology, his neglect of American pragmatism is somewhat surprising. Iser’s concept of the “to-and-fro process of consistency building” accords with Jamesian pragmatic epistemology, which conceives of knowledge construction as an ongoing negotiation between abstract ideas and contingent facts. In other words, pragmatism has itself worked in a to-and-fro epistemological engagement with science over the past two centuries, and Continental phenomenology evinces a convergent emphasis on the situated, processive nature of cognition. Likewise, Husserl’s concept of protentional and retentional horizons and the neuroscientific notion of perceptual framing correlate intriguingly with John Dewey’s notion of the aesthetic as segmented, perceived experience.

Additionally, although Armstrong’s book itself cycles recursively toward the *why* of the aesthetic in its explanation of the *how*, it never overtly places the mechanics of neuroaesthetics within a larger explanatory framework. Unlike many cognitive theorists, Armstrong does not shy away from evolutionary explanations (a convenient means of avoiding ideological conflict in literary studies), and he generally views the brain’s overwhelming plasticity as well as

the constraints on flexibility as evolved phenomena. Integration of his argument into a functional explanation for the evolution of culture, like those presented by Merlin Donald and Steven Mithen, would enforce his audience's understanding of *why* such evolutionarily expensive behavior as art production and consumption not only exists but also has been and likely still is epistemically and socially indispensable in the career of the species.

Of course, no one can do everything in one book, and Armstrong's current contribution is of central importance in its cogent articulation of what science is now finding out about how art is processed by the brain. At present, when so many universities would gleefully discard the study of the arts in the service of a utilitarian turn in higher education, the evidence that Armstrong provides for their vital cognitive function and the coherence with which he presents that evidence is indeed both welcome and timely.

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