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Cognitive and developmental neuro-psychologist, Andrea Berger, has compiled a comprehensive synthesis of contemporary investigations into self-regulation for the Human Brain Development series of monographs issued by the American Psychological Association. Expanding upon "Multidisciplinary Perspectives on Attention and the Development of Self-Regulation," her 2007 contribution with Beersheba-based colleagues to Progress in Neurobiology, Berger's monograph has over seven hundred items drawn from a host of disciplinary enquiries in her bibliography (155ff.). For that reason alone, one might predict this carefully organized albeit at times highly compressed volume will become a standard reference in postgraduate courses with a developmental focus within Education, Neurology or Psychology.

In the first part of this critical review, we shall sample some of the salient claims of Berger's seven-chapter volume regarding key concepts captured by the very title, Self-Regulation: Brain, Cognition and Development. Thereafter, in the shorter second part, we shall raise the question of what she has added to our understanding. This is a question, as we shall see, that is not so much directed at her willingness to report clinical and experimental research and to include occasional critical commentary. Rather, it is directed at the unexpected paucity of theoretical analysis and of contextual information especially though not exclusively within the domain of Berger's own expertise, the developmental pathology of self-regulation exemplified by disorders in attention.

Berger begins her account by acknowledging the sheer longevity of puzzles to do with human efforts to control behaviour and emotions, a puzzle that first exercised ancient Greek philosophers. One need only recall the classical discussions of akrasia, popularly known as weakness of will, in, for instance, Plato's Protagoras (352b-358d) and in Aristotle's Ethikon Nikomakheia (VII.iii, 1146b6 et sqq.), both of which remain a topic of intense debate in moral psychology. Berger, however, rapidly moves to the issue of self-regulation which occurs "whenever we adapt our emotions and actions to situational requirements as well as to social standards and norms that we have internalized" (3). Such self-regulation consequently implies, on the one hand, that we possess the skills of "paying attention, inhibiting reflexive actions, and delaying gratification" (3), but if these skills are absent, on the other hand, that "specific psychological syndromes" in more extreme cases ensue such as autistic, attention-deficit, and related disorders (4). Yet, Berger concedes, self-regulation lacks a "universally accepted definition"; indeed, its manifestations may "not refer to a single process but to a group of mechanisms underlying the ability to self-regulate" (4). Hence, she concludes, the "links" derived from the various "theoretical perspectives under which it has been studied" nonetheless suggest "one common underlying factor behind all forms of self-regulation," namely, "the executive aspect of attention" (4; cf. 20).

After briefly portraying the development of self-regulation "as a gradual transition from external control to internal and efficient self-control" in which infants "become aware and capable of intentional means-end actions" (5), we are in passing referred to two of Jean Piaget's influential works published in the 'twenties and 'thirties respectively. Similarly, when acknowledging how toddlers "begin to
use speech as a technique for controlling actions and thoughts" (7, cf. 9), passing
reference is made to Alexander Luria and Lev Vygotsky by way of the writings of
Laura Berk from the mid-eighties onwards. No other concerted effort is made to
disclose, let alone critically examine, what earlier generations revealed or failed to
reveal about the nature of self-regulation. Instead, after précising conceptions of
self-regulation—as strength of will, as choice between goals, and as a necessary
condition of learning (11-15)—Berger aims to integrate them with her own
"developmental neurocognitive perspective" (11). It is a perspective which
combines "biological endowment" and "environmental variables" (16). By so doing,
she believes the "combined effect of nature and nurture" will help explain individual

Chapter Two steps readers through three interacting cortical networks that
Michael Posner, Mary Rothbart, and colleagues postulate as being involved in the
"orienting, alertness, and executive control" sub-systems encompassed by
attention, the factor underlying any manifestation of self-regulation (20). Because
the executive network, locatable in the frontal region of the brain, is regarded as
central to attention by Posner and followers, it is given far more extensive
treatment by Berger (22ff.). She also seizes upon the importance of clinical
experiments drawing upon conflicting tasks associated with J.R. Stroop's now
classical 1935 paper (23ff.) because executive control is tied to that which enables
good-directed behavior—and thus processes of detecting, inhibiting, monitoring,
resolving, and selecting.

Chapter Three elaborates upon these previously detailed systems and
processes in terms of "the progressive development of the brain infra-structure"
(45). The initial portion of the chapter more particularly concentrates upon cortical
processes related to connectivity at the lower motor and sensory order and then at
the higher order "involved in spatial orientation, speech and language development,
and attention" upon which "areas involved in executive function... and motor
coordination" are said to mature (46). The latter portion is then devoted to the
increasing "functional specialization" of cognitive and emotional regulation
(50ff.). Building upon the portrayal of neurological processes underpinning the
basis of self-regulation, Chapter Four immediately turns to the interplay of nature
and nurture—"genetics and environment" (61)—to account for individual differences
in self-regulation. Nurture is principally demonstrated by parental interactions with
children, ranging from emotional bonding to rearing practices. Nature, which
includes a brief excursus by Berger into genetics for readers unfamiliar with the
field (78-79), centers upon dopamine genetic variations within individuals which are
"associated" with "behavioral tendencies and disorders related to executive
attention and self-regulation" (79).

Chapter Five briefly explores the implications of self-regulation for how
children function in social and academic contexts. It is fundamentally a chapter in
the course of providing readers with a taxonomy of children's social interactions—
compliance, aggression, competence, conscience, empathy, sympathy—which is
overtly reliant upon the work of Grazyna Kochanska and of Nancy Eisenberg in a
series of their respective articles in Child Development since the nineties. On
occasions, Berger draws our attention to potential shortcomings such as "the
difficulty of disentangling self-regulation from motivation" (95). Such shortcomings
tend to be attributed to researchers overlooking empirical variables and not, we
might add, confronting conceptual distinctions between, say, behaviour in
participant and spectator roles or between behaviour and awareness.

In many respects, Berger makes Chapter Six which engages her own area of
specialty, attention deficit hyperactivity disorder, the plat de résistance. "Current
views of this syndrome," she writes, "conceptualize it primarily as a disorder in key
aspects in the development of self-regulation" (105). At the same time, she
interweaves findings from her longitudinal study begun in 1999 on children at
familial risk of acquiring the syndrome. Despite her awareness of the disorder's
"genetic and environmental underpinnings" (107), nothing is said about the ethnic
or religious background of the children recruited from two-parent Hebrew-speaking families nor about the impact of Beersheba being located in a war zone. The "current view" of the syndrome is taken to be that contained in the 1994 Diagnostic and Statistical Manual of Mental Disorders (and re-issued with minimal factual revision six years later), a syndrome divisible into the inattentive, the hyperactive, and the impulsive. For all the heterogeneity of each type, Berger mainly focuses upon the combined kind whilst acknowledging in passing that there are "some claims...that inattentiveness...should be considered a completely separate syndrome" (107). She then proceeds to apply the taxonomy of the fifth chapter to current views of the syndrome presented in the sixth which, neurologically speaking, centers upon "frontal lobe deficits" (109) manifested in "a complex chain of deficits in response inhibition, delay aversion, and executive functioning" (110). Berger astutely resists the temptation to rush to definitive judgments about the repercussions of the syndrome upon children's and adolescents' social and academic performance. On the one hand, it can be "very difficult to tease out... the contribution of the child's own temperament and behavior, which might be partially driving and partially driven by maternal behavior" (123). On the other hand, there appears to be "a high prevalence of comorbid linguistic impairments and reading disabilities" with children suffering the syndrome displaying "delays in their ability to use language to regulate and monitor their behavior" supposedly evidenced by their late "transition toward internalization" of "private speech" (116). Her concluding chapter then documents various programs of intervention, leaving their efficacy and their interaction with pharmaceutical treatment as "an open question" (134).

II

Let us conclude with two caveats about Berger's otherwise comprehensive volume: the first regarding its contextual thinness, the second regarding its theoretical paucity. In the first place, some readers may wish to question why Berger avoids connecting her neurological account with contemporary discussion of neuroplasticity. This hypothesis--that the functions of the brain are not fixed--was unambiguously articulated by William James in the second chapter of his 1890 Principles of Psychology. More recently, it appears in the guise that one sensory mode can substitute for another, thereby suggesting the sheer adaptability of the brain and its synaptic organization from infancy onwards, an hypothesis, popularized nowadays by Elkhonon Goldberg and Norman Doidge, which underpins the influential research of Eric Kandel and Gerald Edelman. Consider the interactions amongst genes or between genes and the environment so carefully summarized in the latter half of Chapter Four. Do they operate independently of appeals to neuroplasticity in general and to the possibility of rehabilitation of the neurologically impaired in particular? If so, then it is surprising to find Berger sidestepping the issue altogether, especially when probing the deficiencies of "brain anatomy, brain functioning, neurodevelopment, and genetics" (105) in the crucial case of attention deficit hyperactivity disorder.

Returning to the case of this attention deficit syndrome from a contextual perspective, we have already seen that Berger identifies the "current" view of it with the 1994 DSM-IV. Does it therefore follow that attention deficit disorder, drawn from the 1980 DSM-III, lacks currency in the same way as does George Still in his 1902 lectures in The Lancet who aligns the syndrome to "a defect of moral consciousness"? Or, to take a more overtly historical case, is currency obviously lacking with the view promulgated by Alexander Crichton, in Book Two, Chapter Two of his 1798 Inquiry into the Nature and Origin of Mental Derangement, which describes the "disease of attention" as "mental restlessness"? The possibility that such views of the syndrome persist to this very day, at least in popular perception, emphasizes two assumptions made by Berger. Firstly albeit less controversially, the conception of "current view" is exclusively that of clinical researchers and is identifiable with whatever is presumed to be their dominant view. Secondly but more problematically, diagnostic criteria of the syndrome, as constantly conceded
by Berger (e.g. 97, 100, 102 & 108), are heavily reliant upon parental and pedagogical sources of information. That alone introduces normative measures subject to variable mores.

In the second place, although Berger construes attention as "the one common underlying factor behind all forms of self-regulation" (4), there appears to be minimal engagement with theoretical debates over the concept of attention. This may lead some readers to ask, for example, What exactly is "the role of speech in the regulation of normal and abnormal behavior" (to cite a title of Luria listed in the bibliography)? In what way might it differ from "Mastering Attention" in the 1931 History of the Development of Higher Mental Functions by Vygotsky (not listed in the bibliography)? Nowhere, it seems, are we provoked to reconceptualize speech and attention as we are within the space of two short paragraphs of Vygotsky's earlier work:

The primary function of speech is not that words have meaning for the child, not that an appropriate new connection is created by the words, but that the initial word is an instruction.

From the very beginning, the child's attention becomes directed attention. Initially, adults direct it, but together with gradual mastery of language, the child begins to direct his attention by the same means, first with respect to others and then with respect to himself (1931, p. 167).

Arguably, the relational nature of attention will not be revealed to Berger or us by relying upon the grossly truncated 1962 version of his Thought and Language.

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