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Cognitive Neuroeducation (CNE) vs. Educational Neuroscience

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Abstract
Cognitive Neuroeducation (CNE) is a learning-based modality focusing on exercising the human social brain to effect optimum levels of cognition and learning realization in reaching positive, balanced, self-actualizing behavioral outcomes in both educational and mental health settings. Although CNE shares some basic principles and objectives with the field of educational neuroscience, there are a number of significant differences. This paper presents a summary of the background and outcomes of CNE and educational neuroscience, highlighting the similarities and differences between the two paradigms of research and application.

An Introduction to CNE

CNE represents a paradigm shift in understanding the etiology of acquired psychological/ behavioral disorganization and cognitive dysfunction through the recognition that any psychological problem or cognitive disorder manifests as a problem in social integration (see Robinson 2021). Human behavior, itself a manifestation of basic cognitive functioning, is a product of an ongoing socialization process operating through the mechanisms of the neuroplasticity of the brain and apperception. Human behavior, including thinking, memory, and all so-called cognitive functioning, is reducible to learning (what is learned and how it is learned — how one learns determines what one learns and what one learns determines how one behaves) as socialization is defined as the internalization of experience (the interpretation and registration of information; i.e., the process of learning) shaped through the social milieu and its prevailing dictates as a function of the biological predisposition forged from the evolutionary process of the formation of the social brain of the anatomically modern human. Though the inherent ability or capacity to learn is affected by genetic and pathological constraints, the human social brain can be stimulated to reach the full potential of its given cognitive capacity and even to extend its cognitive capacity. The CNE modality constitutes a positive learning environment by which constructive social integration, and, therefore, the learning process, is activated, reinforced and expanded by stimulating the mechanism of positive neuroplasticity in the brain, often even in cases of macrostructural damage resulting from disease or brain impact injury.

Through the process of evolution, by which the human brain developed as a social brain, whereby all learning and behavior is constructed within the ongoing mechanism of socialization and all experience is internalized in a social context, behavior is a product of, and response to, social integration or lack thereof. With the exception of tissue degradation from organic

pathology or physical injury, all psychological problems, i.e., all behavioral or cognitive problems, may then be said to be social integration problems — and since socialization and human behavior are learned and not prewired, all behavioral or cognitive problems are, in effect, learning problems.

Succinctly, since behavior is the expression of the mind in interaction with self and the external environment, and the mind is the resolution of cognition (the interface between cognition and conscious behavior), any behavioral problem is in fact born from a cognitive problem, the two terms are completely interlinked and both a cognitive problem and a behavioral problem translate into a problem of social integration, which in turn translates into a problem of learning. Learning is the process by which social integration is achieved, and social integration defines the extent to which cognition and behavior are effectively adjusted for positive, self-actualizing interaction with one's environment.

The emphasis of CNE then is on learning by broadly exercising cognitive processes and stimulating the neuroplasticity of the brain, not only to optimize deep, enduring learning outcomes in and out of the classroom but also to effect positive, self-actualizing social integration in the recovery from cognitive and behavioral disorder, including mild to profound dementia. CNE achieves such outcomes through 1) absorbing content and engaged activities in an enriched environment of interaction; 2) a dialogic foundation of critical, sensitive, and constructive feedback and interpersonal bonding within a highly cohesive group dynamic; and 3) the facilitation of the voice of the individual.

CNE and Educational Neuroscience

CNE falls under the field of educational neuroscience, educational neuroscience more commonly referred to as neuroeducation, and also given the appellation "brain, mind and education." But, while falling within the broad category of neuroeducation, CNE is, in a number of very significant ways, distinct from the conventional category of neuroeducation. Though neuroeducation is concerned with understanding the findings of neuroscience in relation to the mechanisms in the human brain by which learning occurs and applying that understanding to innovative pedagogical practices in the classroom, to date — other than dissociated anecdotal exercises of questionable effectiveness and platitudes that offer scarce application to the practicalities of the classroom — the field of neuroeducation has contributed very little to classroom instruction. In fact, a critical paper by two neuroscientists specializing in the field of neuroeducation has concluded that the findings in neuroscience, in and of themselves, rather than driving educational theories or pedagogical paradigms, are only useful in the confirmation or rejection of the scientific validity of the theories, paradigms or principles either adopted by or that may evolve out of the educational sector (Devonshire and Dommett 2010, 352). A view that may be found in a number of papers by neuroscientists specializing in the field of neuroeducation is that while we may look forward to the great promise of the future of the field of neuroeducation, that promise has yet to be realized and the current efforts and direction in neuroeducation have been less than satisfactory (see, for example, Ansari, Coch and De Smedt 2011; Dekker, Lee, Howard-Jones and Jolles 2012; Howard-Jones 2014; Zadina 2015).

Distinct from the field of neuroeducation, CNE is a modality that was originally developed for the purpose of defining principles and their application for effecting recovery from the cognitive deficits presented in serious mental illness (SMI) — such as schizophrenia, dementia and depression — and in autism spectrum disorders (ASD) and traumatic brain injury (TBI). These principles and their application evolved from a series of ongoing improvements in cognitive enhancement therapy (CET), a cognitive rehabilitation modality that has achieved stellar research results for subjects with schizophrenia, both in efficacy of treatment and durability of treatment benefits (see Robinson 2018). In studying the effects of the CET curriculum, a model of the mind emerged that traced the evolutionary determinants of the development of the human social brain and its consequent precepts of behavior, arriving at the neurophysiological processes of neuroplasticity at the macrostructural level that correspond to learning and the antecedents of behavior. In revising the concepts of CET and the CET curriculum to incorporate this new understanding, CET evolved into CNE, leading to the formation of the field of Applied Social Neuroscience (ASN). In recognizing that learning was the central mediating process of the human social brain, it became evident how CNE could equally be applied to optimizing cognitive functioning in recovery from cognitive and behavioral disorder as well as optimizing learning outcomes for neurotypical children and adults both in and out of the classroom.

Though most certainly falling within the general classification of neuroeducation, since CNE applies research based on findings in neuroscience (though, distinct from neuroeducation, synthesizes those findings with research informed by the social sciences) to optimize learning outcomes, thus sharing a direction and goal parallel to that of neuroeducation. CNE is at the same time an indelible product of ASN and, as a derivative of a modality whose efficacy in optimizing cognitive efficiency in recovery from serious psychological disorganization is well documented, CNE is distinguished from neuroeducation by its pedigree of recognized efficacy in optimizing a broad spectrum of cognitive functioning, including learning realization, and therefore represents rather than a promise for improving learning in the future, a direction and application for improving learning now.

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