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Neurocognitive Learning Therapy: Theory and Practice

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Preface

When people find out that we wrote a book, the inevitable question is “How long did it take you to write that?” When one answers, the typical response is to tell the time from when you started writing, which in this case was somewhat over a year ago. When we started to think about the question in more detail, however, we realized that this book is the result of more than 25 years of clinical practice and discussion. Sometimes the discussions have been intense, and sometimes they have been outright heated, but in the end they represent a long period of intense research and daily interaction. That’s not all we did. Along the way we raised three wonderful children, numerous dogs, the occasional cockatoo, and some unfortunately ill-fated fish.

What started out as a clinical observation, “How is it that kids with ADHD seem to pay attention to things that they like,” has evolved into a fully articulated model of how people become mentally healthy and adaptive. It has also, by default, developed into a model of how people become mentally maladaptive and unhealthy. Based upon that model, we have developed a treatment paradigm, neurocognitive learning therapy. We believe it to be a unique “4th wave model” that is solidly based in neuroscience to achieve its explanatory power. Neurocognitive learning therapy is therefore both a theory of mental health and a method of treatment. When you understand the theory and incorporate the material into your clinical practice, you will become significantly more effective at ameliorating the difficulties that confront your clients.

Our discussions were not always between just the two of us. They often included neuropsychologists, neurologists, psychologists, and other professionals. We were fortunate to be able to present pieces of the model at conferences and receive feedback from attendees. We also received ongoing support from colleagues.

In particular, there were some people who were pivotal and without their contributions this book might not have reached fruition. We would like to thank Len Koziol for his belief in our work, his constant availability to provide feedback, and his willingness to provide an outlet for our initial work. Marci Fox was always supportive and amazingly positive. She always would say “Yes you can” when we were

thinking no we can't. Finally, a big thanks to our senior editor Janice Stern and assistant editor Christina Tuballes for shepherding us through the process. They were ever supportive and always kind.

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Introduction: A Model of Everything Therapeutic

As we developed neurocognitive learning therapy and therapy, the discussion inevitably turned to what kind of therapy NCLT represented. We suppose this is because humans, by definition, love to classify and categorize things in order to understand them better. It initially seemed logical that this new model had to be an iteration of some model that had come before. What became clear through the course of many discussions, however, is that NCLT is not a subclass of a prior model. While it is true that NCLT is built upon well-known therapeutic systems, the fusion of these systems represents a synthesis, or integration of the therapeutic process into a coherent whole, which may be unprecedented in the history of therapy. In this regard, it is a foundational model. It is a unifying model of all therapies, underpinned by an understanding of the brain-behavior relationship. This component is critical as it impacts the clinician's understanding of the etiology and maintenance of dysfunctional thoughts, feelings, and behavior patterns, which in turn affects how we proceed with our interventions. To be abundantly clear, rather than NCLT being an offshoot or embellishment of a currently existing therapy, it is the fusion of psychology and neuroscience, thereby creating the umbrella theory of therapy. In understanding the theory of NCLT, we better understand the totality of the person, allowing us to draw from various strategies, and apply the correct strategy to address the uniqueness of each client.

In order to advance the model, it will be necessary to look at other models of therapy and human development. We present them each with the intent of inclusion of the understanding of each position, and how clearly unified and integral each can be when looked at through the lens of NCLT.

The Development of NCLT

Given our backgrounds, we had immediately thought to ourselves that NCLT would be a new variant of cognitive behavior therapy (CBT). This initial assumption was in part determined by the use of cognitive disputation and reattribution techniques

that occur regularly as part of NCLT practice. Cognitive behavior therapy emphasizes the primacy of cognition in mediating psychological disorder. It aims to alleviate distress by modifying cognitive content and process, realigning thinking and related emotion with reality.

At first, we were somewhat comfortable with placing NCLT within the cognitive behavioral framework, but the more we developed the model, the more the discussion turned to what NCLT had to say about the cognitive primacy vs affect primacy question. Primacy refers to how one initially responds to and processes information. As we reviewed our practices, coupled with neuroscience data, we realized that we had to incorporate the fact that in order to accommodate some of our clients, some of our intervention approaches were being spearheaded by the emotional, cognitive, or behavioral primacy factors which constituted a particular person's process patterns. People presented with different processing styles, and we were responding in kind. This led to the conclusion that we were in fact not traditional CBT therapists. We were not alone. In fact, for some CBT therapists, emotion has more recently become the dominant factor leading their therapeutic interventions. This is exemplified by the introduction of newer variants of cognitive therapy, such as DBT, which do include an emotive component, in recognition of the fact that better therapeutic gain was achieved for some by addressing their feeling states. Nonetheless, the question of primacy remains. This holds, despite the development of newer variations, because the question of primacy defines the intervention. That is, does a person become anxious first and ascribe a cognition to the emotion, or does this process happen in reverse. And how does this take account of more psychodynamic theories of, for example, object relations, which are of pre-linguistic origin? One's position, in part, determines which type of the abovementioned therapies one would engage in. We would likely all agree that a person enters the therapeutic process because they are in distress. But how does that distress come to be, how do they keep experiencing it, and how do we intervene become the questions we must ask. NCLT provides an answer with respect to primacy, and characteristically, it is not the answer most people expect.

Historical Divisions

Traditionally, there are two broad classes of primacy models: affective and cognitive. According to the older affective primacy models, affective information has priority, and its activation can precede identification of a linguistic category for a stimulus. That is, one reacts emotionally and then uses language to decipher the feeling state. This is often countered by cognitive primacy models, which asserts that a person must know what they are looking at before they can make an affective judgment about it.

Traditional Approaches Explained

Traditional affect (emotion) theorists contend that a person's emotional reaction to an event is the direct sequelae of either bodily states or neurophysiological processes. It is a thing to be experienced and does not have preconditions such as analysis or interpretation. Recently, affect theorists have bolstered their argument by noting that their view of an affective primacy, and affective state independence, is derived from a series of findings and phenomena, including the existence of neuroanatomical structures (and neural networks) dedicated to allowing for independent affective process. A related assumption in affective theories of emotion is that there exists a small set of basic emotions and that there are neurophysiological and anatomical substrates corresponding to the basic emotions. Psychologically, basic emotions are considered to be the primitive building blocks of other, sophisticated, non-basic emotions.

NCLT has a strong respect for human development. NCLT recognizes early neurophysiological arousal as a very necessary survival mechanism. For the practicing clinician, what needs to be discriminated is the relationship between these early fight or flight-based arousal responses and the later, partially linguistically labeled, complex emotions that confront us as part of a typical therapy practice. This relationship is explainable using life course and epigenetic models that are an integral part of NCLT. Suffice it to say at this point that the final emotional response is the product of a complex interaction between a constitutionally derived and environmentally experienced developmental process.

Cognitive Models

The affect position is countered by cognitive models that posit cognitive processes are essential to the experience of emotion. The cognitive perspective is based on the premise that emotional experience is contingent upon a person's appraisal and interpretation of the event or stimulus. This appraisal is often based on reinforcement history and or the individual's predisposition to interpret events in a particular manner. Ellis, in his rational emotive therapy A-B-C model, highlighted how the consequence (C) was the result of the belief (B), or appraisal, rather than the activating event (A) itself. Beck developed cognitive therapy highlighting dysfunctional thoughts as the etiology of dysfunctional feelings and behaviors.

Many people conclude that this means that cognitive therapists subscribe to the notion that thoughts cause feelings and that feelings cannot be created without thought. This is not entirely accurate, however. Cognitive behavior therapy posits that *modifying thought* has *primacy* when attempting to change many of the behaviors associated with mental dysfunction.

Neuropsychological Models

Neuropsychologists have focused on identifying various brain areas and systems that may mediate the experience of emotions. In this regard, neuropsychologists attempt to identify integrated brain networks involved in the expression of human emotion. The question of cognitive vs affect primacy has often produced mixed results, although we will later discuss newer research which supports the integrative model proposed by NCLT.

Cognitive and neuropsychological models usually posit that the genesis of emotional responses or affective states is dictated by the manner in which an individual ascribes meaning to the environment. In both models, emotions are produced and differentiated based on the perception of the situation or event as appraised by the individual. An added feature of neuropsychological models is that information processing or computational functions of integrated neural networks are hypothesized as the basis of all psychological processes, including emotion.

All of the above occurs in the context of the field not being able to agree upon how many emotions there are or what types of emotions exist. Some theorists still argue for a core of basic emotions that serve as the building blocks for all future emotions, and some people argue that there are as many emotions as there are individual people's responses to unique environmental situations. That is a lot of emotions.

Integrative Models

The situation remains confusing and largely unresolved and has led some to conclude that all of the research is indeterminant as regards primacy. Recent research has in fact indicated that there are elements of both cognitive and emotional primacy models in most situations. Others have taken a different approach and have tried to develop models that represent a fusion of what is known. These views frequently argue that cognitive networks that support information processing, and affect driven networks that support physiologically based emotional responses, initially exist independently of each other. They grow increasingly interdependent over time and reach the point where they are, in regard to emotion, one network indivisible. This most recent group of models, rather than seeking to solve the debate over Cognitive as opposed to affective primacy, posit that a more productive and accurate goal may be to determine the factors that cause affective information to have processing priority in some circumstances and semantic information in others. These models incorporate the truly integrated nature of the connectome as regards emotional responsivity. They recognize that the same stimulus can activate different neuro-cognitive representations every time it is encountered. The specifics of the response is co-determined by the stimulus itself and the contexts in which it occurs.

NCLT and the Independence of Emotional States

NCLT considers the emotions encountered in therapy to be developed from cognitive labels, and the learned response tendencies associated with them are assigned to physiological changes resulting from the appraisal of threats, stress, or potential reward in the immediate environment. NCLT theory extends these appraisals to the contextually based cognitive labeling of an individual's physiological responses. Emotions are regarded as forms of cognitive appraisal evolved from experiences (initially flight or fight responses) and as states of action readiness related to the original pre-automatized appraisal. To answer the question regarding emotion's independence from cognition, it is important to look at this notion of action readiness.

Action Readiness

Action readiness essentially represents automated predictions of what the person is physiologically and cognitively primed to do (action tendency) in a given situation. In this view, emotions are grounded, primed, and stable activation patterns that have developed over time and, because of their high predictability, have become automatic. These predictions are continually updated by cognitive and bodily feedback and remain stable as long as the feedback remains as expected.

NCLT theory recognizes that primary emotional reactions are rooted in flight or fight responses that characterize the responsiveness of infants. For the more differentiated emotional responses (action tendencies) that develop later, an active cognitive labeling process is a critical part of development. The question regarding its potential to become independent from cognition is therefore changed and is framed by a different and often critical question: Is that active labeling process required every time that emotional response, which has already been primed, is triggered by a stimulus? For NCLT, and other action readiness models, the answer is that the active nature of the labeling process is not required every time one encounters that stimulus/event. To understand the reason that it isn't, one must understand automaticity. NCLT defines automaticity as a desired outcome of learning wherein a habitual behavior/response is elicited by environmental stimuli without conscious consideration of outcome. It is a desired outcome because humans have limited working memory and there is a need for a system that handles many mundane activities without contribution of higher order cognitive capacity. That system incorporates the activity rendering it automatic.

Automaticity implies that at some point in its development, an emotional response, if it is experienced enough, is able to be elicited by a stimulus without the benefit of the language-based or cognitive interpretation, which was critical in its formation. For example, think about a person who is afraid of spiders. When they see a spider, the emotional flight response is automatic. The individual does not have to go through a reasoning process. They are automatically afraid. Similarly, if

a parent sees their child, they don't have to think about the fact that they love them. They just do. That is because the emotion and language labeling have been paired so many times that they are connected automatically, and the emotion is automatically produced as soon as the stimulus is presented. At that point, emotion is largely independent from cognition. This is a point we sought to make in our book, *Depathologizing Psychopathology* (2016). The goal of all learning, including emotional responding, is automaticity.

This is not to say that if you wanted to change the automatic emotional response you would not have to go back to the maintaining cognitive pairing as cognitive therapy suggests. You might very well have to, depending on the outcome you wanted. However, as classical conditioning models have demonstrated, you might not have to. In certain clinical situations, merely diminishing the undesirable emotional response may suffice.

The NCLT Answer

The more we learned, the more it became apparent that there was not a consensus as regards the primacy of cognition or emotion in the development of the emotional life of a human being. In fact, as we have seen, primacy may be the wrong question altogether in that there is increasing evidence that cognition and affect develop simultaneously, and cannot, and should not be picked apart. Primacy does remain a key question, however, as regards the treatment of problems associated with emotional regulation.

In its philosophical approach to the development and expression of emotion and its related behaviors, NCLT is very clearly in the integrative camp. As we have written elsewhere (Wasserman & Wasserman, 2016), NCLT posits that the networks that carry affective, physiologically based responses are integrated with cognitive appraisal networks to form a comprehensive and interdependent system for complex emotional and behavioral responsivity. The end point in the generation of a complex emotion may, in fact, be an emotional and physiological response that is free of the cognitive elements that figured into its creation. This is because the goal of all human cognitive activity is the efficient use of working memory and the efficient creation of action potentials. NCLT's answer to the primacy question basically states that in the beginning of the creation of a complex emotional response the question of primacy is irrelevant, because all of the components, cognitive, physiological, and visceral, must be in place for the emotion to be created at all. The question does remain integral to treatment.

Primacy in Therapy

When it comes to the question of how to change emotional and related behavioral responses, it is vitally important to identify what is discussed and targeted in treatment.

Or so people continue to argue. Treatments differ. Some treatments target emotional responses first (tell me how you feel?), and other treatments target the cognitive appraisal of the situation (tell me how you think?). As regards the role of primacy in therapy, NCLT clearly postulates that the response to the question of primacy is situationally and/or person specific.

This situational specificity determines the NCLT therapist's response to the primacy question as regards the therapeutic endeavor. NCLT theory supports the concept that emotions may be regulated at any of five points in the emotion generative process: The therapist can choose when the individual identifies a particular situation as problematic, identifies a particular behavior as problematic within that situation, when they deploy their attention to a particular element of that situation, when they attempt to change a cognition associated with the situation, or if they want to change the emotional response to that situation. NCLT theory recognizes that different strategies have been postulated to achieve successful emotion regulation depending on the point of the process one wishes to highlight in the therapeutic discussion, and where in the process the best result can hypothetically be obtained. Techniques can run the gamut ranging from suppression, attentional control, distraction, and cognitive change to reappraisal. These techniques may include cognitive behavioral techniques, integrative techniques targeting the pairing of the emotional response and the related behavior, acceptance, relaxation, mindfulness, etc. NCLT asks you to remember that these techniques, many of which are successful and readily utilized, are techniques. NCLT is designed to help the practitioner understand the rationale for implementing any given technique at any given point. Therefore, more than a model of therapy, NCLT is a system of therapeutic interventions that incorporates and provides an empirically valid, etiological foundation for many of the known models of therapy.

Primacy, Recruitment, and Treatment of Disorders of Mental Health

The NCLT model suggests, in the context of disorders of mental health, that processes involved in emotional regulation are recruited during task performance. What this means is that there are learned contextual combinations of emotional, cognitive, and physiological responses that are a part of every disorder of mental health. For NCLT, therapy is considered a process of increasing the likelihood of the expression of adaptive behaviors, emotional responding, and thought processes and weakening or unlearning maladaptive ones. For NCLT, the therapy process goal is to eliminate maladaptive behaviors and thoughts which have become automatic and develop new adaptive behaviors and thoughts which will become automatic. In NCLT, therefore, the cognitive appraisal and the emotional response are components of an integrated whole, and primacy is relegated to an interesting question for intervention purposes. That is, an emotion, physiologic response, or thought can be clinically chosen, targeted by an empirically valid change technique selected by the clinician based upon its goodness of fit with the goal and processing style of the client, and the therapeutic result would be the same: new learning and a new set of responses.

Clearly then, there are situations where the discussion of cognitive appraisal is important, emotional appraisal is important, and developmental issues and automaticity are important. Just as clearly, the selection of an approach in the NCLT model does not therefore depend on the answer to the question of primacy per se, but rather recognizes the relative contribution of each of the above factors to the complexities of the individual, and relies on the identification of the target response, cognitive, emotional, or automatic visceral responding, the process of its development and maintenance, and the utilization of an empirically valid technique to change it. Within this foundational model, all prior models of therapy have a place. NCLT helps to explain why.

Reference

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Part I

NCLT Theory

Neurocognitive learning theory, as regards the development of mentally healthy behavior, is based on contributions from three branches of science: learning theory, small world hub models of cognitive processing, and epigenetics. In this first part, we will discuss the contributions of each of these to the overall model.

NCLT theory of treatment is based upon the above three branches with added consideration of the contribution of the science regarding reward valuation, automaticity, and memory reconsolidation. These will also be discussed in this part.

For neurocognitive learning theory, learning is defined as a process which includes emotion, cognition, and neurophysiology. Behavior is defined as the expression of these components.

Chapter 1

Introduction to Neurocognitive Learning Therapy

Neurocognitive learning therapy (NCLT) is a unifying therapeutic system which targets disorders of mental health. It is designed to work with, and make use of, our understanding of how the human brain processes and learns information while respecting the inclusion of developmental life span (or life course) issues and neurophysiology. It is, as a therapeutic intervention, unique in this regard. Some mental health therapies were developed in response to specific etiological hypotheses (psychoanalysis) or operant learning principles (applied behavior analysis). Others had no etiological basis at all, but relied on healing concepts such as self-actualization. With full respect for the complexities that make up human qualities, NCLT is based on information processing theory and models of integrated brain networks organized along small word hub principles. There is nothing else like it.

As we have demonstrated in our earlier book *Depathologizing Psychopathology* (Springer 2016), understanding that all learning, whatever the subject, issue, or person and emotional valence thereof, occurs over the same neural networks, and is subject to the same laws governing working memory allocation, attention, processing efficiency, memory, and expression and engagement, makes it possible to develop a set of principles that would facilitate learning in the therapeutic environment. How this facilitated learning occurs in an environment where an individual is seeking to address issues related to mental health (therapy), is at the core of NCLT.

In this book, we will demonstrate how the principles of learning and understanding of integrated brain networks can be made into a unique and comprehensive intervention for disorders of mental health.

NCLT Is a Unique, Integrative System

NCLT represents a unique system that does not fall neatly into any of the existing therapeutic disciplines simply because it is a comprehensive fusion of neurophysiology and learning principles. We posit that therapeutic principles that form the core