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Articles regarding diagnosis, treatment and practice of medical psychology for pre-vention and amelioration of disabling conditions or human suffering are welcomed. Documentation of current practices in the diagnosis, treatment and prevention of health disorders is essential for the development of techniques and methods of medical psychology and may be given preference. Issues dealing with the economics of access to health care, the political aspects of the scope of practice of medical psychology and comparison of techniques of diagnosis and treatment in healthcare are within the purview of this Journal. Articles dealing with the education, training and advancement of medical psychology in the public interest are included in the broad-spectrum of the definition of medical psychology. How advancements in other scientific fields will affect medical psychology will be considered for publication. The Journal also publishes timely brief reports of research germane to medical psychology and health care.

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Reference Style examples

Muse M & McGrath R. Training comparison among three professions prescribing psychoactive medications: Psychiatric nurse practitioners, physicians, and pharmacologically-trained psychologists. J Cl Psycho. 2010, 66, 1-8.

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Changing of the Guards: Medical Psychology's Intrinsic Leadership Readiness in a Leaderless Integrated Healthcare System

Jeffrey D. Cole, PhD, ABMP

Prologue

In the summer of 2021, the Academy of Medical Psychology (AMP) initiated an ongoing series of lectures for the benefit of our members. The "Meet and Greet" (M&G) series—now known as "AMP Grand Rounds"—are a monthly presentation by the ABMP board and interested AMP members to the AMP membership where members can learn and teach medical psychological concepts, theory, intervention and methodology, earn CE credits and get to know one another. Recent Grand Rounds presenters include Dr. Susan Barngrover on interactions between the COVID pandemic and individual trauma and treatment, Dr. James Underhill on ethics, Dr. Rory Richardson on mitochondrial physiology and mental health, Dr. Cal Robinson on Medical Psychological approaches to Pain Management and Dr. Keith Petrosky on Medical Psychologists in Primary care, Dr. Ward Lawson (Executive Director of AMP) on epigenetics and medical psychology and the author of the present article Dr. Jeffrey D. Cole on a relational psychotherapies and stress physiology (RPSP) model of health, illness and healing. Dr. Amie Cooper, an ABMP board member has directed the technological component of the series making it possible for presenters and audience members to enjoy seamless presentations without concern about technical glitches.

In October 2022 as part of his Presidential Initiative Dr. Cole presented a special edition of his RPSP series emphasizing the readiness of AMP credentialed medical psychologists to take a leadership role in the current climate of integrated healthcare. The present article is both an overview of the RPSP model and a highlighting of how the larger AMP medical psychology model—and AMP medical psychology practitioners—are in position to act as guiding forces in the current integrated healthcare climate. Subsequent articles will delve, more in depth and detail into the RPSP model and its interface with contemporary integrated healthcare needs of the community.

It is hoped that publication of the material will provide our readership not only with meaningful and useful information about the relationship between relational experiences and physical and mental health, illness and healing—and about AMP medical psychology's readiness to take a leadership role in healthcare—but, will also provide readers with a sense of the material covered in the Grand Rounds presentations and will encourage and stimulate similar articles by other presenters outlining and summarizing their Grand Rounds presentations and explicating their sub-specialty areas within medical psychology.

Abstract

The larger healthcare system has put an increasing emphasis on integrated medicine. However, professions with the greatest recognizability in healthcare—medicine and nursing—lack an emphasis, in training and method, on integrated biopsychosocial methods important in coordinating and guiding integrated healthcare teams. Moreover, as a group, they

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lack a psychologically informed understanding of a key factor in any successful treatment: the doctor-patient relationship. This lack of leadership capacity has resulted in business interests increasingly becoming the sole determinants of healthcare processes contributing to the erosion of effectiveness on some fronts and erosion of patient and provider satisfaction on many fronts. Medical psychology, with its roots in relational factors intrinsic to human psychology—while also informed in medical science—has the right integration of knowledge bases and skills to lead integrative healthcare. A general model that shows the continuity of our relationship with the environment we are ensconced in—especially the interpersonal environment—and how this relationship is internalized and affects our internal environment, culminating in either health or disease expression informs a health, illness and healing paradigm more conducive to integrating domains. Integrated—or system—processes and structures are best understood looked at as progressing from the largest most macrocosmic—in this case "environmental relatedness"—sphere down to the most minute, microcosmic—in this case biomolecular—sphere (while acknowledging the reciprocation from the microcosmic to the macrocosmic). This "macro to micro" continuity can be illustrated by looking at specific disorders, e.g., major depressive disorder (MDD), bipolar disorder and attention deficit hyperactivity disorder(ADHD) and showing the correspondence between specific interpersonal-affective and defensive—or psychogenic stress—patterns associated with these conditions and the logically-consistent detection of these patterned responses neurologically (e.g., at the amygdala) and transmission of the information neurologically and endocrinologically through to disease expression as a specifiable disorder. Treatment formulation can be derived from this integrated understanding referred to as a Relational Psychotherapies and Stress Physiology (RPSP) model.

Introduction

Debates about the relative effectiveness of psychotherapy versus medication and the effectiveness of one model of psychotherapy versus another are perpetual in psychological and psychotherapeutic literature. The decades-long hegemony that medications x psychotherapy—in particular cognitive-behavioral therapy (CBT)—are the most effective treatment modality for commonly-encountered conditions, as reported in the academic literature, has not jibed with what many practitioners experience in clinical practice. In practice, most experienced psychotherapists are eclectic drawing on a combination of therapies that almost always includes attention to relational factors. The reality that relational factors—warmth, empathy, a common goal and shared patient-therapist conceptualization of health and healing—are essential in effective therapy was established well before CBT was even developed as a psychotherapeutic modality. Yet, for many years psychotherapeutic models that intrinsically applied relational concepts and methods were overlooked in deference to academically "testable" approaches amenable to population studies, grant-seeking and commensurate with established programs of research in institutions based on these characteristics. This has had the unfortunate result of bleeding back onto the practitioners wherein "those that research what to do tell those who know what to do by doing what they do," i.e., the pushing of academically, so-called "evidence-based practice" into the practice-based-practice space.

Individual differences are not artifacts of human functioning, including in the psychotherapeutic context but, are instead what constitutes individual human *being* and relating. As such, individual differences are as salient in psychotherapeutic process as are commonalities (represented in research by "population parameters" and "sampling statistics") between humans. And, individual differences can only be addressed, psychotherapeutically through here-and-now, interpersonally attentive approaches in relationship with a given patient. Thus, much of what contributes to healing processes in psychotherapy cannot be tested through population methods but can only be explored interpersonally; initially, in training through processes of clinical supervision and, subsequently, internalized and carried forward into the therapist's professional work with his or her patients.

The present paper posits the role of relational factors in the psychotherapeutic process not only in terms of their relevance to mental health, illness and healing but also their deterministic role in physiological processes associated with mental health and physical health. The specific model that the author is developing is the Relational Psychotherapies and Stress Physiology (RPSP) model based in the relationship of interpersonal-affective experience with specific neurophysiological and neuroendocrinological events together with which comprise the human stress response. That is, human stress is a mind->body event that can only fully be understood by including the full continuum starting with human interaction, situationally and developmentally and the response of brain, neuroendocrine and neuronal structures to these interactions. Health outcomes, e.g., depression and other disorders can be understood in terms of the physiological changes wrought by this chain of events. Thus, depression, for instance can be understood as having neurotransmitter correlates but these correlates can be situated as variables in a "cause-and-effect" chain where they mediate causal environmental-relational—as well as "upstream" neuroendocrine—events affecting disease expression, rather than acting as isolated, determining (independent) variables (such as in the "what is wrong at the synapse" perspective evinced in modern biopsychiatry).

The RPSP model will be presented here consistent with its presentation as an AMP Grand Rounds series of presentations. Each presentation developed a specific aspect of the model while tying the components together to create the overall model. The model is presented in this way for two reasons: 1) It efficiently orders the component parts of the model to be more digestible conceptually; 2) It highlights the value of the AMP Grand Rounds program for both the presenters and membership as a venue where innovative healthcare approaches can be developed, taught and learned. Please note: in the narrative of the text there is some fluxing between narrative voice, i.e., "first person/third person" as there is an effort to capture the presentational experience as much as possible while still maintaining coherency as a scholarly thesis.

The Relational Psychotherapies and Stress Physiology (RPSP) Grand Rounds Series

At the time of writing, the RPSP series consists of seven modules with more to come in the future. RPSP focuses on the relationship between interpersonal-affective experience and conflict, stress, neuroendocrine pathways and processes, symptoms, disorder and treatment. The importance of RPSP is paradigmatic, encouraging reflection on causality assumptions of prevailing mind-body, biopsychiatric models of health, illness and healing (wherein biology is considered substrate to psychological events) and encouraging consideration of an *alternate causality* wherein relational-affective experience sets in motion physiological, neuroendocrine events, and resultant synaptic events, and wherein associated neurotransmitters/neurotransmitter activities act as mediators between psychological events and clinical presentations. There are obvious implications for treatment.

The following is a brief breakdown of the seven modules as they were presented to, first the American Board of Medical Psychology (ABMP) (Modules 1 and 2) and then to the full AMP membership (Modules 3 through 7) over the course of 2021 and 2022. Afterwards, the focal material from each of the seven modules is presented more in-depth thereby articulating the model.

The Seven Modules

Module 1: In the first module of the RPSP series the present author presented an overview of stress psychophysiology outlining a pathway from early developmental, interpersonal-affective attachment experiences through situational interpersonal-affective experience, stress physiology (e.g., processes of the Hypothalamic-Pituitary-Adrenal [HPA]

axis), changes in brain chemistry and disorder. The first module, for heuristic purposes, differentiated processes and events associated with stress from those associated with anxiety.

Module 2: focused on the special relevance of a relational mind-body model given growing evidence that psychotherapies resulting in biological change are more effective than other psychotherapies and given the segue from physiological co-regulation to interpersonal-affective co-regulation in early development.

Module 3: focused more in depth on the processes by which parent-child physiological co-regulation are "yoked" with early interpersonal-affective attunement and containment processes thus tying physiological response into interpersonal-affective response and the impact of relational events—including psychotherapy—on stress physiology.

Module 4: took a relatively in-depth look at the role of the amygdala and amygdalar response and innervation, its role in detecting survival salience in stimuli, including potentially atomistic interpersonal-affective events. That is, this module looked at the stimulus characteristics of affective attunement/misattunement and affective containment/lack of containment as potential survival-related phenomena detected by the amygdala thus initiating sequences of neuroendocrine events comprising physiological preparedness consistent with the physiological leg of the stress mind-body continuum.

Module 5: looked at various psychophysiological patterns associated with specific disorders in terms of interpersonal-affective developmental and situational relational events, patterns of attunement/misattunement, defenses and stress associated with these disorders.

Module 6: was a preparatory presentation to, and exploratory discussion with the American Board of Medical Psychology (ABMP) to explore current foci and clinical models supported by and practiced by our AMP leadership and membership. This module is mentioned here only for purposes of clarification where the numbering of the modules is concerned and is not germane to the RPSP model itself though is important in terms of the emphasis given in presenting aspects of the model.

Module 7: was a Special Presidential Initiative presentation to highlight AMP Medical Psychology's readiness to lead healthcare in an integrated healthcare climate and drew on the RPSP model as an example of integration of biopsychosocial variables and to illustrate the role of variable type in appreciating a paradigmatic shift toward a medical psychological model of health, illness and healing.

The remainder of the paper discusses the seven RPSP Grand Rounds presentations summarized above. The themes of the presentations, together, comprise the major components of the RPSP model.

Module 1 (ABMP Meet and Greet Presentation, July 2021): Psychodynamics and Physiology of Stress versus Anxiety from a Relational Perspective

Contrasting stress with anxiety:
Contrasting stress with anxiety—at both psychological and physiological levels—reinforces our awareness of and attentiveness to nuances of mind-body phenomena. While these terms are often used interchangeably by the public—and sometimes by healthcare professionals—they are discreet phenomena on psychological and physiological levels.

Anxiety is our psychophysiological response to threat. The threat can be external (physical or social aggression, a test coming up or a meeting scheduled with the boss tomorrow) or it can be internal (typically associated with a nascent, emerging emotion, e.g., "defenses giving way" and repressed or dissociated feelings emerging into conscious experience).

When the system perceives it is being threatened it rallies its defenses including preparedness to fight with, flee or hide from the threatening stimuli. All the responses require increased mobilization of systems of sensation and perception, cardio-vascular and cardio-pulmonary response, galvanic skin response and musculoskeletal response in varying degrees and ratios depending on the specific self-protective response and the relationship between the individual and the specific stimulus. This "emergency response system" is largely constellated around neuroendocrine sympathetic and adrenal-medullary activation (the "SAM"—or sympathetic-adrenal-medullary—axis). Activation of the SAM axis results in immediate and vigorous initiation of emergency responsiveness evidenced in increased heart rate and respiration, increased muscle tone, increased sensory-perceptual acuity and increased galvanic skin response and sweating (Lee & Park, 2011). All these behavioral responses increase the individual's ability to survive a threat by increasing the individual's strength and reaction time, sensory-motor coordination and execution and elusiveness to an aggressor or predator.

Stress is a subtly different psychophysiological response. Stress is a response to a "potential threat" wherein conditions are such that an imminent threat—and thus the need for an imminent behavioral response—are lacking but conditions are not secure and the system cannot settle into a state of homeostasis as awareness of conditions conducive to threat are detected and monitored. Again, the situation can be external as in a work environment wherein the pressures to maintain a demanding level of work output are ever-present due to the presence of a demanding and severe boss, taking multiple, difficult college classes wherein maintaining good grades in all cases comes with additional challenges, being burdened by bills wherein income is not adequate to induce a sense of security in being able to maintain one's budget. On an interpersonal and psychodynamic level stress essentially means "protracted, unresolved emotional conflict" or, more to the point, "unresolved, protracted interpersonal-affective conflict" given that most human emotional conflict is ensconced in interpersonal interaction and experience.

The Relationship between Stress and Mental and Physical Health Disorders: An Overview and "Why?":

Whereas anxiety is an *emergency response system*, stress is more of an *emergency preparedness system.* While both conditions are important clinically—and both are addressed clinically—the presented model assumes anxiety to be a clinical symptom or condition, in its own right, whereas stress has the primary role in disease development. Thus, understanding psychogenic stress as an event starting in our relational interactions with our environment and culminating, via neuroendocrine and neural pathways in disease outcome is the focal event of the presented model.

While anxiety, a normal response to threat can constitute a health problem for its own sake—when protracted and disconnected from soluble environmental conditions—it is more problematic for the associated existential/subjective distress and potential to interfere with functioning "in the moment." Stress, on the other hand, has the potential to exact long-term changes in physiological functioning, neurobiologically, neuroendocrinologically and in the immune system including its interface with the cardio-vascular system (Conrad, 2011) and to act as the progenitor of disease, namely those diseases we see in the consulting office just a few examples of which include those that will be looked at more closely from

the perspective of the presented model in the present paper: Major Depressive Disorder (MDD), Bipolar Disorder (BD) and Attention Deficit Hyperactivity Disorder (ADHD).

Why exploring psychogenic stress as a causal factor in disease etiology is of such key importance: "Spontaneous Generation" and The Perceived Genesis of Mental Health Disorder:

Neuroendocrine changes can result in the observable symptoms of mental disorders. However, they are not the causes of mental disorders. Most mental disorders (excepting the eponymously named "organic disorders" and those "due to a medical condition") are caused by interacting social, situational, relational, developmental and affective factors and learned behaviors that—taken together—result in these neural and neuroendocrine changes that in lay, popular culture have taken on the identity of "cause of mental illness." These same factors can also activate genetic events that then also become determining variables, through gene methylation and demethylation and epigenetics. However, the primary focus of the present model is the direct, determining role of interpersonal-affective factors on neuroendocrine and neural activity leading to disease expression and resolution.

Observing mental health problems, we may arrive at a seeming "cause-effect" relationship between specific neurochemical or neuroendocrine events and clinical presentation. But, the matter did not start here. In fact, neurochemical events—for example, changes in serotonin re-uptake—are mediating variables near the end of a long string of independent and other upstream mediating variables.

To appreciate the contrast between a causal perspective and a symptom-based perspective lets draw on a historical analogy: the transition in scientific thinking about biogenesis from a spontaneous generation model to that of biological reproduction. "Spontaneous generation" here is an analogy for the metapsychology of modern biopsychiatry (as associated with psychopharmacology-primary approaches) whereas biological—meiotic (sexual) and mitotic (asexual)—reproduction is a metaphor for a psychological mind-body model as follows.

Spontaneous generation was the general scientific perspective prior to1864 (when it was disproved by Louis Pasteur) wherein it was believed that life emerged from other, unrelated organic material: for example, that flies were produced by rotting meat. Pasteur conducted an experiment trapping a piece of meat in a sealed container and showed that no flies emerged. Thus, it was determined that there had to be some interaction of the meat with the environment to lead to generation of flies and, it was discovered, over time, that there were in fact several processes including meiosis, flies landing on and laying their eggs on the meat and mitotic processes of cell division resulting in new flies.

The biopsychiatric community—urged on over the years by the pharmaceutical industry—has gradually eroded the conceptual equivalent of meiotic and mitotic generation and returned us to a pre-scientific era of spontaneous generation where mental illness is concerned. Phrases like "my mental illness is due to a chemical imbalance" are both encouraged by and encourage such a perspective. "Off my meds" or "off his/her meds" similarly reinforced the idea that mental health problems are spontaneously-generated "medication-deficiency syndromes" without existential cause.

Psychologists, however, are scientists as well as practitioners and from a scientific perspective this "spontaneous generation" perspective on "what's going on at the synapse" is suspicious. We can see that events that are not exclusively "chemical events at the synapse"—but, rather, far upstream from these events—also result in remission—and even

resolution—of mental health problems. These events include sitting with the individual and interpersonally-affectively interacting with him or her, over a period of time, in attentive and specialized ways, i.e., psychotherapy.

While it is understood that there is *some* relationship between neurochemistry and clinical presentation it is evident that there is much more involved and that neuronal events are proximal causes—or *mediating variables* (MV's)—rather than ultimate causes (or independent variables: IV's). In fact, psychotherapy patients are often observed saying things that sound contrary to "my mental illness is due to a chemical balance," things like, "I went to psychotherapy and I was able to go off my meds."

Module 2 (ABMP Meet and Greet Presentation, December 2021): The relevance and application of an interpersonal-affective developmental model to mind-body treatment of stress and related disorders

Stress, Relationship and Psychotherapy

My model for understanding and treating mental health disorder is relational, grounded in object-relations and interpersonal psychoanalytic-informed, psychodynamic theory. Like most practicing psychologists I draw on different treatment approaches and concepts but whether I'm looking at patterns of automatic thoughts—such as is a core tenet in cognitive-behavioral therapy (CBT)—the role of a frustrated drive, such as in classical analysis, or the unfolding life story that is the individual's humanistic-existentialism, the core elements of relationship and emotional experience, and how these are intertwined from earliest developmental experience up through adult life, relational experience serves as my guiding principle or lodestar for approaching the difficulties my patient is grappling with and thus the problems that my patient and I are struggling with together.

Every school of thought in psychology and theoretical practice model on which our psychotherapies are based have secondary utility in emphasizing important aspects of life on a larger scale. Humanistic-existential approaches remind us of the intrinsic value in being human and the validity of attending to and tuning into our authentic individual paths. CBT, in addition to a very structured and clearly-articulated approach to therapy reminds us that our interpretation of events—not only the events themselves—are important, and of the importance of considering how practice and theory line up—or don't line up—from an academic perspective, e.g., where treatment approaches can be operationalized and measured in not just individuals but populations amenable to statistical analysis. Psychoanalytic approaches remind us to be aware and attentive to the power of the unseen depths of human experience, analogous to the enormously powerful magnetic geological forces and ocean currents beneath—and lunar gravitational forces far above—the directly observable waves and tides. Relational approaches, meanwhile keep us mindful that we—even when we are talking about "we" as a collection of individuals and a given individual—are intrinsic to human experience: we—each of us—are continually "in relationship with" not only each other but the universe as a whole. Relational models, it could be said, are present in all models as all human phenomena (sensory-perception, cognition, behavior, emotion, our physiological response) are always looked at and understood as "*in relationship with*."

In part, because of the ubiquitousness of relational factors in human experiences (and in the universe itself) relational approaches are very difficult to operationalize in a way that applies to systematic application across a population or across a subject pool, i.e., as one might seek out doing population studies. The elements of relational therapies are so

microcosmic and nuanced—and as such so extremely multivariate—they can largely only be assessed through cumulative experiential data and taught, initially only through attention to the same nuanced variables as these emerge in clinical supervision.

Relational psychotherapy:
As the psychogenic leg of the mind-body stress continuum defined in the presented model is relational—and from this relational model comes the segue to the physiological leg—I will spend just a few moments reviewing core elements of psychotherapy from a relational perspective.

The psychogenesis of stress from a relational perspective can be understood as residing in *protracted emotional conflict* (Conrad, 2011; Ostlund, Measelle, Laurent, Conradt&Ablow, 2017). How do emotions come into conflict and how does this conflict become protracted? And how does this relate to an object-relational developmental model of relational therapies?

The relational developmental model I work from is heavily based in the work of Daniel Stern (1985) who was one of the first clinician-researchers to closely examine the early formation and internalization of object representations in early development. The basic components of this process are:

1) Attunement
2) Soothing
3) Containment (or what could be termed “Resolution”)
4) Presence-Absence-Presence sequences
5) Affect Modulation

Here is how the object representation and internalization process occurs with these elements as sequential steps:

1) The mother—or other primary attachment—and infant unite and extend their associated physiological attunement from gestation onward to an affective bond through affective attunement. This is the process wherein mother draws on her evoked experience of her interaction with her infant, in the best of circumstances that meaning those internal experiences evoked by the infant’s affects and emotional needs. The baby expresses hurt, pain or sadness. The mother responds to her intrinsic registering of the baby’s feelings and needs with an extrinsic expression of hurt pain or sadness. If the baby makes a sad face and cries, mommy makes a sad face and with sad-sounding voice says, “Oh baby is hurt [or hungry, or cold or lonely or sad].” If baby is happy and laughing and giggling, mommy’s face fills with glee and she coos, “Oh, happy baby!”

Or, some obvious, external expression of baby’s experience.

2) Mother’s joining with—or attunement with—baby’s emotional expression is key to the larger idea of relational factors in stress and stress resolution and results in what we call soothing. Our understanding of what accompanies baby’s emotional experience is anxiety. An adjusted adult who is sad or lonely, unless there is a problem that often can be traced to problems in these early attunement-containment processes is not likely to experience anxiety in the same way we think of an infant or small child experiencing anxiety with emotion. That is because by the time an adjusted adult reaches adulthood, he or she knows that his or her separation doesn’t extend to the universe at large. Help is available. The problem is fixable even if the moment is difficult. For baby, mother is the universe. And, until connection is established (through attunement) with the mother it is not only the emotional need that is acting it is the uncertainty or insecurity that this need is recognized by the uni-

verse, the only place the infant has to go to resolve the problem and the emotion. Mother's attunement communicates awareness and attentiveness to baby's experience and reassurance that not only is the hurt or sadness known but help is possible.

3) This process of soothing results in the affective experience being containable for the infant. The emotion and emotional need now do not separate baby from the universe they are an experience resolvable in the universe. The baby has his or her feelings. The feelings don't have, or overwhelm the baby. Anxiety is ameliorated.

4) Amelioration of anxiety acts as a negative reinforcer. That is, it strengthens the event that resulted in its occurrence. The events is that bond between mother and infant and the association of that with experiencing and responding to emotion. Over time the attunement interactions change in ratio in time and frequency as baby matures physically and mother feels more at-ease with larger expanses of time between direct interpersonal contacts. This "going and coming" of mother's presence with the baby—or these *presence-absence-presence* sequences with the baby—result in strengthening of the baby's internalized imago of the mother and along with that increased security in the baby's relationship with his or her emotional experience and emotional needs. We refer to this as the *internalized object representation* and it becomes the basis on which baby responds to interpersonal-affective experience—and the quality of his or her *object relations*—throughout life.

5) The particular ability or capacity that the baby-cum-child-cum-adult develops through this process, relevant to stress and the problem of protracted emotional conflict is *affect modulation*. Affect modulation is essentially the ability to access, experience and express one's emotions without being overwhelmed by those emotions.

Stress (again) in a relational and relational-developmental context:
If, from a relational perspective stress is protracted emotional conflict. How can we draw on the object-relational developmental model above to understand this?

As stated, a key element in the resolution (and thus containment) of affect is soothing. If soothing does not occur the individual does not *have* the emotion. The emotion *has* the individual. That is the emotion is not contained and does not resolve.

Why would soothing not occur? Soothing is associated with attunement and attunement is an interpersonal process either in the past (our early object relations) or currently (such as when a patient talks with an emotionally-attuned therapist). There is always an interaction effect in our object relations between past and present. Our past object relations control and predict our experience of our current object relations. Our current object relations can call forth, and sometimes modify our object relations we internalized from the past. (One way psychotherapy can be understood from an object-relational perspective is it is the process of modifying object relations internalized in the past through current object relational experiences between patient and therapist. Achieving this end requires knowledge of, and attentiveness to countertransference as will be discussed at a later point).

Past and present interact in this way to determine whether there is help from "the universe" (the environment in which we are ensconced) where a particular stimulus is concerned. There are different reasons a sense of help or security might not occur. For example, our early attachment experiences might have been with a distracted or preoccupied caregiver. With stress, an important element in absence of soothing is conflict. The irresolution of one emotion interferes with the resolution of another emotion. A classic example is that where individual feels tormented and persecuted by her boss at work. She is angry and resentful

of her boss. But, because of the power inequity in the boss-employee relationship she fears expressing her anger and resentment to him. Fear obstructs resolution of anger.

If I am not able to express an emotion because of, for example, the interference of another emotion there is no opportunity for an attuned response from another. Thus, no soothing can occur. And, with no soothing no resolution or containment can occur. Then, because (back to the example) the anger is not resolved the fear associated with impulses to confront the other with our anger and get resolution also does not resolve.

Stress Physiology in the Context of Interpersonal-Affective Conflict

Our bodies respond to this situation as a complicated and (in our relational world if not our emotional experience), paradoxically—*remotely present*—threat. Remotely present in that, unlike anxiety where there is an immediate threat to be dealt with stress is concerned with a conditional threat. The circumstances evoke constitutional vigilance that requires, not immediate defensive action but preparedness in the event action must be taken. The threat is present enough to alarm the system; but, too remote to act on imminently.

Thus, where, as previously described, anxiety engages sympathetic medullary activity constituting—behaviorally—the well-known "fight, flight or freeze" response, information about stress is assessed by the amygdala where it is routed through the frontal cortex and hypothalamus toward a system-wide physiological shift known as *allostasis* (Fekete, 2014). In a stress situation, information from the hypothalamus is sent to the pituitary which sends information endocrinologically to all the glands. In the stress response, of special importance is the adrenal cortex. This connection—the hypothalamic-pituitary-adrenal (HPA) axis—is the physio-anatomical circuitry we widely understand as the core physiological circuitry of psychogenic stress (Conrad, 2011).

With the information received from the pituitary the adrenal cortex engages in processes of anabolism and catabolism wherein cortisol and glucocorticoids affect the sugar production in the liver and the production of adrenaline and norepinephrine which act—system wide—as hormones and at the synapse as neurotransmitters and result in changes in glutamate and serotonin availability in the brain.

Back to relationship. (No medication—necessarily—required)

The relational- emotional processes—described earlier from the developmental perspective—gone wrong resulting in stress and initiating this sequence of physiological events resulting in serotonin depletion in the brain can be reversed. While medication can potentially augment this process, returning the brain to a normal neurophysiological state does not necessarily require medication. It means addressing the relational-affective (attunement, soothing, containment) problems, that caused them, such as through relationally-informed psychotherapy.

An SSRI medication can, in some cases boost a return to homeostasis if it supports engagement in accessing more attuned relational processes. But, this is not necessary—on the whole—to reverse these processes. And, when medications are used they typically need only be applied transiently until the interpersonal-affective changes are established. SSRI effects are largely due to placebo (Kirsch, 2019). That is to say, it is the relational element in the use of the medications that is largely responsible for what effect they do have. Psychopharmacokinetic phenomena can be understood more readily given this awareness. For example, "SSRI poop out" can be understood as "the placebo effect has worn off." So-called "breakthrough symptoms" mean the person was just given a drug that temporarily affected observable symptoms; but, the patient's depression has not been treated. Cognitive-Behavioral Therapy (CBT) is a popular therapy among clinicians. However, there

is probably more likelihood that there will need to be a "combined treatment"—ongoing use of medications and therapy together—when CBT is the treatment modality. This is because CBT targets thoughts as independent variables (IV's) with emotion and mood as outcome variables. Relational-emotional factors as independent variables (IV's) must be addressed directly to address and resolve stress. This can happen to a degree with any therapy where there is a good therapeutic relationship but the stress resolution outcome is likely due more to that factor than, for example, to the cognitive-behavioral intervention. We see this also in behavioral interventions like systematic desensitization or implosion therapy where the key factor in the intervention is the containing effects of the patient's established relationship with the therapist when the intervention is applied.

Relational therapies with stress: Projection, transference, countertransference and other relational phenomena:
The etiological factors in stress are as described above. The resolution of stress in psychotherapy then has to do with providing our patients with an alternative interpersonal-affective experience. Exquisite attention to attunement and soothing needs, their contribution to affective containment and consistency across time will always lead to relative improvement for our patients, often to marked improvement and cures. Not just "remission" and, "have to be on meds for life"

The complications in providing these very straightforward-seeming interventions—on the individual-case psychotherapy-relationship level—include also-internalized relational phenomena having to do with internal pressures on the patient—and in turn on the therapist—exerted by his or her need to maintain the primary attachment relationship. These phenomena are transference, countertransference, projective identification and parataxic distortion.

Knowing, perceiving and addressing these obstacles to the attunement-containment process largely rely on clinical supervision. In the US, CBT has had hegemony in psychotherapeutic teaching—if not practice—for decades. Unfortunately, the CBT body of thought is not entirely friendly to these psychoanalytic arena from which these interpersonal concepts largely emerged. However, if you are a primarily-CBT-oriented clinician please consider the benefit of these concepts and methods that greater pro-active inclusion of these relational concepts and interventions in your armamentarium could provide.

One quick example, I worked with a doctoral student in a CBT-oriented Clinical PhD program who wanted to learn psychoanalytic-psychodynamic principles in her work with me but she wanted to maintain her identity as a CBT therapist and primary method as CBT. She had one patient who would discuss and process how to do the CBT writing assignments during session but who never applied them outside of session. And, she became irritable and defensive if the therapist (my student) asked her about her homework assignments. The other patient worked endlessly on her CBT writing exercises outside of session but she never benefitted from this activity. So, my student and I analyzed these cases from a relational perspective including further interview with the patients. In both cases transference was at play. In the former case the therapist was perceived as a persecuting object when encouraging the CBT writing looking for an excuse to critically evaluate the patient (similar to the patient's experience of her relationship with a critically-evaluative mother). In the latter case, the patient wanted to please the therapist never considering that the therapist's relationship with her was based on providing *her* help and she could only do this if the patient candidly communicated her needs. So, just as she did with her own parent she provided for what she assumed were the therapist's needs instead of attending to her own needs. ()That is, her own needs other than the need to main-

tain connection with the therapist. A phenomenon that will be discussed in the later section on defenses. In both cases the patient and therapist were able to arrive at a balancing of attention on the CBT exercises with the other relational and communication needs that allowed some relative transcendence of the impasse and more effective intervention with the writing exercises.

It is possible for two people to have a dialogue about their relative experiences and needs, including their emotional experiences and needs. This is the case in a transferring and countertransferring therapy relationship, dialogue between psychologists from opposing schools of thought, psychology and medicine and political parties. We are at a juncture in history where attention to this reality is not only greatly reduced—in all the described spheres—in deference to objectified technologies, time economics, sensory-perceptual experience and the forensics of human differences; but, perhaps dissociated as a necessary sphere of consideration at all. And, the cost is huge. In USA every week there are multiple mass shootings. Mental health needs of our citizens are under-addressed. And, even as pharmaceutical companies have largely dropped-out of the psychopharm research game due to lack of efficacy and failure to nail any primary, causal role in mental health to neurotransmitters psychiatrists and family physicians continue to push and prescribe psychotropic medications very heavily.

Please consider, in approaching pharmaceutical substances and their prescription relational factors and where on the trajectory of primary versus augmentative we put each. Clinical psychologists have by far the most extensive training in the causes—all the causes—of mental illness and personality disorder when compared with any of the professions that treat these problems. When you add post-doctoral training in psychopharmacology and medical psychology we are off the charts. Please keep this in mind when confronted with the business, competitive and economic pressures coming from entities potentially much less informed than we are on these matters.

Application of the described relational principles to stress where stress is protracted emotional conflict: Tracing backwards from, or reverse engineering the attunement, soothing, containment, presence-absence-presence sequence through-to-affect modulation model means starting with problems of affect modulation that constitute emotional conflict, i.e., emotions obstructing the resolution of other emotions, such as fear obstructing the resolution of anger. The anger does not resolve because it is not contained and it is not contained because soothing has not taken place and soothing has not taken place because there is no attunement. Thus, the feelings are defended against, generally with repression though in some cases with dissociation. With repression it is more straightforward so, in the interest of the theme of the present paper we will talk about that. I will encounter both the anger and the repression defense in my patient's presentation. I hear the anger in my patient's tone of voice, choice of language and see it in a rigid or tense body posture. I detect the repression defense in some bluntedness of affect, controlled or monotone speech and restricted bodily movement. I attune with both affect and defense. I register and communicate to my patient an awareness and acceptance of their anger through tapping into a like internal experience and registering the feeling in my tone of voice and emphasizing key words indicating anger in my reflective statements. I, however, modify the extent of my expression of affects through these modes to match my patient's repressive defense. This accepting, acknowledging—attuned—response to both my patient's affect and defenses connotes safety to my patient. This is emotional safety where, with repeated such experiences over time, my patient grows more at ease with his or her own emotions and allows more of his or her emotional experience into expression in session. As my patient has these consistent experiences with me, over time he or she will move to a place of

greater readiness to address his or her emotional needs and experiences proactively and to extend this experience to interpersonal relationships outside of the therapy relationship.

At this point it becomes very useful to educate my patient in communication skills that will best facilitate engaging with others with language that will increase his or her odds of experiencing said attunement, the classical "I statements." "I statements" are most useful when they are constellated around emotional expression. Thus,"I am angry..." "I am sad..." "I need..." These are very basic tools. Counseling 101. However, if we apply them in the context of the object-relational—attunement, soothing, containment... etc.—model they take on a new depth and sophistication and effectiveness. I am teaching my patient how to do things that will increase his or her opportunities to experience interpersonal attunement—and thus soothing, containment and affect modulation—that will eventually become self-reinforcing. When my patient has the experience of painful affects—or affects painfully accompanied by anxiety—being contained this is a relief and negative reinforcement occurs and my patient is motivated to pursue these kinds of interpersonal-affective experiences over those that were conditioned by early attachment dependencies that locked my patient into a defense-driven mode of responding. When my patient's affect is contained my patient can modulate his or her response to the feeling more effectively and this makes resolving protracted emotional conflicts—such as are present with stress—more likely. When pressure from the emotional-conflict dynamic is reduced internally the readiness state occurring internally is down-shifted by communication from the hypothalamus that allostasis can be abandoned, homeostasis is returning and assistance from the adrenal cortex via the production of cortisol and neurotransmitters can be abandoned. This ultimately results in re-establishment of serotonin levels in the brain and, in the case of depression remission of depression. How do I know that I can change the serotonin levels in my brain? The pharmaceutical companies tell me so. The pharmaceutical companies tell me that depression is due to problems with serotonin re-uptake at the synapse. While this is a gross over-simplification– and misinterpretation of a mediating variable (MV), the synaptic event with an independent variable (IV), which, in fact is the individual's relationship with his or her environment—it is true that when neurotransmitters change symptom expression changes. However, because the IV is really the relationship with the environment—especially other people—I can change the symptoms through changing the mediating variable (the synaptic event) by creating a different relational experience for my patient. Thus, I treat my patient—all the way through to mediating synaptic event and symptom outcome—through relational intervention. My patient's depression remits and he or she is no longer depressed. Evidently I corrected my patient's serotonin levels via psychotherapy. According to the pharmaceutical industry I know this must be what happened without ever having to directly research the correlation between these variables. There is abundant literature showing the correlation between serotonin availability and symptom presentation in depression. What has been left out is the cause of the serotonin availability (MV)—or lack thereof—that is, the relational experience over time (IV) and this is the piece that a medical psychological model—and intervention—provides.

Case example illustrating problems with attunement/containment/affect modulation: Richard

Object-relational psychoanalytic-psychodynamic-informed approaches are deceptively simple on the surface. They just look like attentive listening and empathy. Most of the work that goes on is internal for the therapist and—while there may be many facets to the process—boil down to managing countertransference in order to maintain emotional immediacy with the patient, that is to say maintain affective attunement. The reason for this is the attachment relationships that are internalized (as per Stern above) include the misattunement experiences that were part of the individual's original attachment relationships. These

"expectations" if you will become a pressure on the therapist to respond to the patient in the same misattuned way.

Eric was referred to me through his parents one of whom I also previously worked with. Eric was in his second year of college in a hard sciences related program. His first year had gone well but starting his second year he was running into difficulties. He was missing a lot of classes and just staying back at his dorm and not doing much of anything. His mood was increasingly depressed and his affect increasingly flat. He was becoming increasingly mute. His parents were not able to "get [understand/attune with] him" (potential counter-transferential event #1. CT#1) to talk about what was bothering him. Ultimately, he was found wandering around campus, noncommunicative, in a seeming daze and almost completely mute. He gave a vague impression of attending to internal stimuli and he was also vaguely non-committal about whether he was hearing voices or experiencing other possibly psychotic phenomena. Much of his presentation was similar to that of a prodromal schizophrenic patient (potential counter-transferential event #2. CT#2). His parents brought him to his session and with patient's permission they attended his sessions with him for the first several months of his treatment.

So, regards CT #2 I have worked with hundreds of schizophrenics of various subclassifications over the course of my career, mostly within institutional settings and most with established diagnoses by the time I started to work with the particular patient. Many had, per their record and staff description had presentations initially like or similar to Eric's. If Eric had initially presented to a medical model practitioner (e.g., biopsychiatrist) he would potentially have been prescribed a neuroleptic almost immediately. However, Eric was not presenting with any dangerous behavior toward self or others and he was able to maintain his survival needs now that he was moved back in with his parents.

It was evident Eric had never throughout this episode expressed anything about his struggles from his personal subjective experience other than vaguely that a change in his roommate situation had disappointed him. His parents, both very loving, kind, concerned parents nonetheless showed almost no *overt* awareness of or interest in patient's emotional experience (as differentiated from his mood, i.e., his depression). They were sad he was suffering afflicted with some unknown malady but there was almost no attention to or follow-up on his affective presentation. They would ask questions about mental health disorders, types of treatment possibilities, what—in a theoretical sense—could be causing his problems. But, almost no voiced or otherwise indicated awareness that, for all his withdrawal and relative flatness there was indeed some affect being conveyed,

Thus, fear and sadness. Erich had a generally downcast expression, occasionally one could detect his eyes beginning to tear and as one got to know him the glimmer of self-protectiveness behind the "flatness" became evident. Much of the early interventions with Eric centered commenting on his evoked feelings, i.e., Carl Rogers 101: "This is hard for you to be here," "It's hard to talk about this," "You don't even know why it's painful but you know it's painful."

Managing the countertransference involved largely not demanding anything of Eric in terms of responding to these observations—only attending to his response in turn—and processing a similar urge with his parents whom, in their understandable urgency for him to return to a greater degree of comfort and become his old familiar self again would continue to try to coax him to share information and ask questions he was in no space to answer, and, express in his presence their also understandable frustration at the slowness of the process of just sitting with someone and being aware of them and communicating the awareness while not putting any demands on them.

Over time with this persistent "presence" (both mine and that of his attentive and fast-learning parents) with Eric's actual experience—instead of with his wished-for experience or presentation—he started gradually to evince some increased sense of safety through increasing range of affect. He began to show facial expression, his occasionally watery eyes would actually form tears that would trickle down his face and he would cry.

The routine continued, observant attentiveness, sharing associations, "You're feeling sad," "This is hard," "It's hard to put into words," and supporting his parent's efforts to modulate their own urgency and unintended demands for Eric to be experiencing something different than he was actually experiencing and meanwhile reigning in my own counter-transferential experience of the same impulses and wanting things to proceed faster, knowing "if he could only speak his experiences this would progress faster," but always reminding myself of my primary directive, "I am here to be present with my patient and ultimately that means being present with and attentive to his emotional experience and needs regardless of where I think things should be or what the progression of events should be."

I always defer to my patient's wishes regarding medications. They would have been an absolute disaster in this case because, as I said, given Eric's presentation, the likelihood he would have been prescribed neuroleptics and the likelihood he would have been treated, henceforth as having a severe disorder instead of having unaddressed emotional experiences he would never have received treatment. However, neither Eric nor his parents ever requested medications and, I should add his mother had a healthcare background and was very informed also about medications and never, as they say "went there." But, had any of them indicated any interest in medications I would have supported their decision and helped them to get a medication evaluation.

So, to speed up the telling of a therapy that worked because it was not "sped up" Eric over time became increasingly more and more expressive in all ways, verbally, affectively. There were multiple occasions where he would burst into wailing sobs burying his face in his hands and shaking his head and gesticulating with his hands. Over time he increasingly expressed his grief and fear verbally. He began to relate early childhood events involving other adults (not sexual abuse but very hurtful responses from adults in authority) that his parents had never known about and for the first time was able to get understanding, empathy and validation for his feelings associated with events that occurred a very long time ago but which were entirely in the present in patient's memories and associated feelings. This gave not only myself as his therapist but also his parents who were present the opportunity to provide Eric the immediate, empathic, validating and attuned response he needed to these never-before-expressed feelings. As he progressed his range of affect returned to full normal, his cognitive functioning returned to full normal, his mood improved markedly, he became behaviorally active and interested in his future and, ultimately was able to get a job and start working. I continued to work with Eric individually for a couple of years past the time when we were all meeting together as a family. He, at the time he terminated therapy was working two jobs and about to shift to one higher level job with a different company. He had obtained an associates business degree and was generally happy with euthymic mood and optimistic about his future.

All this—return form a schizophreniform-appearing illness to reintegration with society—was largely based on topographically what looks like basic "active listening skills" or "Rogerian therapy." But, it was with the crucial added elements of: 1) a prime directive that it is my job to stay present with my patient emotionally, at all times, that is maintain affective attunement; and, towards that end, 2) managing countertransference elements that will try

to drag me, the therapist everyplace but into an attuned space and ultimately toward re-enactment of the original misattuned attachment experiences; 3) Just continuing with this until the patient returns to health, and, finally, 4) no medications necessary but with the potential for recommendations if requested by the patient.

Module 3 (AMP Meet and Greet Presentation, January 2022): The Special Relevance of Relational Approaches to a Psychogenic Stress Model of Health, Illness and Treatment: Physiological Co-Regulation and Yoking with Interpersonal-Affective Attunement and Containment Developmental Processes

Mother-infant physiological co-regulation:

Affective Attunement and Containment:
Stern's Attunement model as an interpersonal-affective model
In Module 1, Stern's (1985) model of affective attunement and containment and how this is related to (and, in the developed person is) affect modulation. Here we will explore the process in some more depth and detail. I will include some case examples with two or three cases that are very different in some ways but which illustrate the commonalities of this underlying dynamic even in cases which are topologically very diverse.

To review, the components of the model are:

Affective Attunement
Soothing
Affective Containment
Presence-absence-presence sequences
Affect modulation (can be internal or interpersonal)

Here, we will be looking at the progression from physiological attunement and containment (via the infant's relationship with the attachment figure) to affective attunement and containment. This continuity is especially important from a RPSP perspective given the segue between relational experience and neuroendocrine response. Moreover, it is relevant to current findings that psychotherapy resulting in physiological change is perhaps more potent and effective than other forms of psychotherapy (Kamenov, Twomey, Cabello, Prina & Ayuso-Mateos, 2017), and medications with their limited range of physiological impact versus the more encompassing, systemic effect of relational and behavioral change (Kamenov, et al., 2017) .

Yoking of Mother-infant co-regulation and affect attunement/containment:

> Emotions are not simply concepts that live privately in the mind, but rather affective states that emanate from the individual and may influence others. We explored affect contagion in the context of one of the closest dyadic units, mother and infant. We initially separated mothers and infants; randomly assigned the mothers to experience a stressful positive-evaluation task, a stressful negative-evaluation task, or a nonstressful control task; and then reunited the mothers and infants. Three notable findings were obtained: First, infants' physiological reactivity mirrored mothers' reactivity engendered by the stress manipulation. Second, infants whose mothers experienced social evaluation showed more avoidance toward strangers compared with infants whose mothers were in the control condition. Third, the negative-evaluation condition, compared with the other conditions, generated greater physiological covariation in the dyads, and this covariation increased over time. These findings suggest that mothers' stressful experiences are contagious to their

> infants and that members of close pairs, like mothers and infants, can reciprocally influence each other's dynamic physiological reaction (Waters,West&Mendes,2014, p. 934)

Mothers and infants live in the context of each other. An infant is not "just hungry." He or she is also *showing* or communicating hunger through wincing, crying, scanning (the environment) —and myriad other signals his mother and other caregivers come to recognize—conveying the baby's internal state, interpersonally.

One can see from this compiled list from Healthline (https://www.healthline.com/health/baby/signs-baby-is-hungry#common-hunger-cues) the many ways that an infant communicates hunger. And, see how closely some of these expressions resemble expressions of frustration or other emotions associated with need, want, AND deprivation. A sampling includes:

- being more awake and active (thinking about food makes babies excited)
- turning their head to the side, as if looking for food
- opening and closing their mouth (like little birds waiting for the parent bird in a nest) turning their head toward the breast or chest, or a bottle
- making sucking motions with their mouth (even if they don't have a pacifier)
- smacking their lips, drooling more, or sticking out their tongue
- sucking on their fingers, hands, or clothing clenching their hands into little fists (they're getting a little frustrated and impatient!)
- staring at you and following you around the room with their eyes—if you're the primary person who feeds them giving you a furrowed brow, distressed look that says, "When are we eating?" (end quote)

The progression from physiological attunement and containment and affective attunement and containment is likely complex and based in repeated interaction:

> The foundations of emotion regulation are organized, in part, through repeated interactions with one's caregiver in infancy. Less is known about how stress physiology covaries between a mother and her infant within these interactions, leaving a gap in our understanding of how the biological basis of emotion regulation develops. This study investigated physiological attunement between mothers and their 5-month-old infants, as well as the influence of maternal depression and anxiety, during stress recovery. During the reengagement phase of the Still Face Paradigm, mother-infant dyads exhibited negative attunement, as measured by inverse covariation of respiratory sinus arrhythmia (RSA). Increases in maternal RSA corresponded to decreases in infant RSA, underscoring dyadic adjustment during recovery. Moreover, infant regulation differed as a function of maternal anxiety, with more anxious mothers having infants with higher RSA during reengagement (Ostlund, Measelle, Laurent, Conradt&Ablow, 2017)

<u>The importance of physiological impact of psychotherapy</u>:
It is known that relational factors—interaction with the environment in general—and behavior engage a far greater range of neuroendocrine response than do psychotropic medication. This stands to reason, given that with relating and behaving all systems—sensory-perceptual, cognitive, affective, motor—are engaged in behavior and each of these is connected to complex and far-ranging neurobiological structures and processes.

Recently, studies are showing that those psychotherapies associated with measurable biological change are perhaps more effective than other psychotherapies:

> …. (i) depending on the disorder under investigation, psychotherapy results in either a normalisation of abnormal patterns of [brain] activity, the recruitment of additional areas which did not show altered activation prior to treatment, or a combination of the two; (ii) the effects of psychotherapy on brain function are comparable to those of medication for some but not all disorders; and (iii) there is preliminary evidence that neurobiological changes are associated with the progress and outcome of psychotherapy (Barsaglini, Sartori, Benetti, Pettersson-Yeo & Mechelli, 2014)

Before moving on to a review of Section 4 I briefly mention the role of defenses, and their relevance in both attunement and containment processes and the continuum with neural and neuroendocrine response in the brain and throughout the system. I will elaborate further on these psychodynamic-cum-physiological dynamics in Sections 4 and 5.

Defenses are psychological processes that allow us to cope with failures of our attachment figures—on whom we are dependent—to attune with, and thus contain our affects. The attachment is prioritized over the affective access because we depend on the attachment figure for survival. Despite the psychological cost, survival is prioritized over access to our feeling states.

I will compare the experience of misattunement with a type of attunement somewhat different than the attunement with affects Stern describes and that is attunement with defenses. Attunement can be thought of as always having a conscious dimension—including when attuning with defenses—whereas misattunement is unconscious and, in psychotherapy and psychoanalysis driven by the countertransference. However, as we know we can also be conscious of our countertransference impulses—instead of acting them out—and in this consciousness we are aware of nuances of the defenses the patient is contending with including the underlying developmental misattunements he or she experienced in his or her attachment history.

Physiology and "Salience for survival": So, we've differentiated misattunement from "attunement with defenses." Let's circle back for a moment to the idea of the role in creating biological change in therapeutic outcome. That there would be increased therapeutic effect with psychotherapies that affect biology is understandable given the concept of *integration*. Integrated changes in a system—such as a mind-body, or human system—are more sustainable because the system continues to function as a system albeit at a different level.

Think about the relationship between allostasis and homeostasis. When the system is required by environmental demands to adjust its equilibrium or homeostasis we call this allostasis. It's a new homeostasis at a different level. Allostasis involves multiple anatomical components, physiological systems and psychological processes. Multiple components must adjust because the parts and processes are interdependent. If one component of a system changes, but the other components do not this is going to create an internal pressure that will result either in the overall system not functioning properly or a return to an earlier level of homeostasis (such as in therapies that have temporary effects but no lasting change, e.g., often this is the case with psychopharmacotherapy without psychotherapy, where neuroendocrine and other physiological targets are very limited versus engagement with the interpersonal environment, or cognitive-primary interventions such as CBT as thoughts are not primarily integrated with physiological processes in the way, or at the level that early-developmentally-based relational-affective experience is).

Module 4 (AMP Grand Rounds Presentation, April 2022):
Interpersonal-Affective Conflict, Survival Defenses,
the Amygdala and Pathways to Disorder
(Major Depressive Disorder, Bipolar Disorder and ADHD)

Amygdala

Misattunement and attunement with defenses—both of which I will further define and provide examples of—are differentiated not only in the individual's interpersonal-affective response—especially affective resolution, containment and affect modulation—but, also in terms of what happens at the amygdala.

Given the conflicting evidence associated with the role of the amygdala—threat detection or register of emotional experience in general?—observation from clinical practice suggests that the amygdala is not so much responsive to specific threat but rather to the congruence of stimuli with survival, that is whether the situation is safe, all things taken into consideration.

There is evidence that the amygdala has diverse functions. It does play a role in the processing of fearful emotions and in identifying threatening stimuli. But, evidence also shows the amygdala has a role beyond simple threat detection including linking neutral stimuli with positive experiences (such as is seen in classical conditioning, i.e., pairing). As such, the amygdala possibly plays a role in assigning value (positive or negative) to stimuli and, as such, possibly plays a role in the formation of positive and negative memories. (https://neuroscientificallychallenged.com/posts/amygdala-beyond-fear)

Otherwise stated, the amygdala's role is to declare (to its innervated brain regions), "Here is a stimulus—or collection of stimuli—that have salience in organismic survival. I am passing along the relevant associated information to the other brain areas to assess the role as supporting or threatening survival." That is, it detects survival-related stimulus salience.

Let us look at amygdalar pathways—to/from (afferent/efferent)—and the associated brain regions to say more about how misattunement would be differentiated from "attunement with defenses."

Amygdalar innervations with other brain areas:
The amygdala receives input from and sends input to multiple brain areas including the hippocampus, hypothalamus, prefrontal cortex and septal area and every sensory area. And is integrated with visceral and somatosensory inputs. (Chapter 6: *Limbic System: Amygdala,* Anthony Wright, Ph.D., Department of Neurobiology and Anatomy, McGovern Medical School Revised 10 Oct 2020 https://nba.uth.tmc.edu/neuroscience/m/s4/chapter06.html)

The amygdala is a "deceptively simple" brain structure in terms of its apparent function and what it is up to when one takes a closer look. Identified, in 1822 by Karl Friedrich Burdach (Pabba, 2013), the amygdala was thought early on to be a threat detection and fear elicitation organ. That is, stimuli were transmitted from the multiple sensory pathways to the primary sensory cortices and higher association cortices to the amygdala which then identified threatening stimuli and communicated this stimulus characteristic to the cortex and other areas of the brain to prepare for a threat to the system.

In the 1970s and 1980s as brain science technology improved it became apparent the amygdala is more multifaceted with multiple functions most of them related to emotion and

memory (McGaugh, Cahill & Roozendaal, 1996). It has been shown that the amygdala also registers positive emotions (McGaugh, Cahill & Roozendaal, 1996). As the amygdala was further examined it became clearer that the amygdala—which indeed is involved in the system's response to threat in one way or another—had a more specific role of "salience recognition." This could be defined as, detection of stimuli that have relevance to survival in one way or another, for better or worse.

Perhaps, partially associated with its memory function the amygdala detects stimuli that "have a history with" the individual either directly or by conditioning or association. The amygdala says of the stimulus, "You are familiar," or, "you remind me of something," or, "you are worthy of further attention." Stimuli that have no particular survival relevance—and one can think of the relationship between affects, defense formation, dependency and survival needs in early attachment relationships as translating into "survival relevance"—are addressed by the system more glibly. They or the system can take care of itself without special awareness or attention from the system. They are addressed "on autopilot." Those stimuli with "survival relevance"—again, think of the relationship between affects, defenses and "the other" and dependency needs—are given further consideration—or "flagging"—by the amygdala and transmitted to the prefrontal cortex and other brain areas for assessment.

The amygdala is a complex structure anatomically and worthy of attention and study in its own right. For our present purposes however it's the connections between the amygdala and other brain areas that are most useful to discuss. These are the pathways that lead to or away from—i.e., the afferent and efferent pathways respectively of—the amygdala that illuminate our story about misattunement versus attunement with defenses.

Amygdalar afferent pathways:
Primary afferent pathways to the amygdala include the sensory pathways, e.g., those that transmit visual, auditory, tactile, gustatory and olfactory information.

Superior colliculus-pulvinar-amygdala subcortical visual pathway: These pathways include the *superior colliculus-pulvinar-amygdala subcortical visual pathway*. This pathway is believed to be involved in processing emotion-related visual information. Rather than determining spatial location of a stimulus this pathway is involved in alerting an animal that something appears that could have survival salience. It is more concerned with the appearance or disappearance of a stimulus than with its physical characteristics (Wang, Yang, Meng & Ma, 2018).

The thalamo-cortico-amygdala pathway is involved in the mediation of auditory fear conditioning. This pathway initiates freezing response to threat. (Boatman & Kim, 2006)

How misattunement and attunement with defenses are likely registered at the level of the amygdala
We saw from discussion of the amygdala and its pathways that the amygdala's primary job in threat detection is to recognize stimulus salience, i.e., "this is something… maybe good, maybe bad …maybe neutral…but something we need to check out further." Consider the progression of infant-mother attunement from "identity" (one organism when the fetus is gestating), to a physiological operational continuum shortly after birth when mother responds imminently to baby's physiological needs, to an affectively attuned dyad—with affects still largely "one foot in physiology"—as baby matures. If this continuum remains largely unbroken then a sense of strangeness or otherness does not occur until the baby is well into maturity and able to process self-other experiences at a conscious level. As such, interpersonal-affective experiences between mother and infant are an extension of

the known to baby. And, they are a continuum between baby's immediate experience and survival, survival being continuum with mother. Only those stimuli which register as outside of this known continuum would be detected by the amygdala as "salient, worth checking out further"—possible threat to survival—with the suspect characteristics communicated to the prefrontal cortex for further processing.

The amygdala and misattunement*: One stimuli that would potentially register with the amygdala is if a baby's affect was one thing and the mother's was another, i.e., if the mother's affect was misattuned.* Such a "discontinuum" would be registered by the amygdala as "salient; possibly relevant to survival" because the infant's survival is predicated on his or her experience being a continuum with the mother. If, at the level of the prefrontal cortex this information is registered as "threat" then the baby withdraws his or her affect as it is associated with "an experience of discontinuance with the mother."

Neuroscience, pharmacotherapy and defense against affects: Up until recently it has not been convincingly shown that "knowing more about the brain substantively improves mental health care" because the most effective mental health treatments are some form of psychotherapy and trained therapists do not need to understand the brain in able to be able to provide effective psychotherapy. Neuroscience has been helpful in other ways, e.g., addressing brain trauma, addiction, and so forth. And, it gives us a picture of some of the things that happen neurologically and neuroendocrinological when medications are introduce into the system. But, most of the causal mechanisms in psychotherapy are external to the body in the relationship between the patient and therapist and in the ways these patient-therapist experiences are then extended into the patient's life on a larger scale, i.e., in terms of his or her interactions with others and the world at large. (The internal mechanism are the patient's and therapist's histories of interpersonal-affective experience stored in the nervous system. These internal representations and external relationships hook up, "lock and key" and are the basis of what we call "object relations").

Interpersonal-affective experiences can be challenging and in cases of severely destructive developmental hurts and trauma can be almost unbearable even to the therapist especially if still early in training or experience. Instead, defenses kick in for the therapist as well as the patient. Patient defenses—and clustering of defenses—have been extensively explored and categorized (as mental health disorders in leading nosologies). Categorial therapist defenses (those defenses the therapist brings to the therapy experience itself) have been less extensively explored but one category of therapist defense is psychopharmacotherapy, i.e., the replacement of affective attunement with administration of a substance. As with other defenses use of medications can either be a misattunement with the patient's affective experience and needs or can be an attunement with defenses in cases where the patient him or herself "just wants something to feel better" before encountering more challenging affective states (which will require the accompaniment and established attuned, containing relationship with the therapist which takes time and effort on the part of both).

Amygdalar Efferent Pathways:
Previously, routes by which information about survival-salience stimuli reached the amygdala—i.e., afferent pathways—was discussed. Here, the efferent pathways, along which information filtered at the amygdala is transmitted to other brain areas is discussed. Primary efferent pathways from the amygdala are those that transmit "salient" stimuli characteristics to other brain organs, especially the frontal cortices, locus accumbens, hippocampus and especially the hypothalamus.

These efferent pathways include the ventral amygdalofugal pathway, the anterior commissure and the stria terminalis. The ventral amygdalofugal pathway—while not the primary pathway to the hypothalamus (that pathway being the stria terminalis)—provides a direct, short route. This pathway is of particular importance in associative learning, i.e., the "pairing" processes of classical conditioning (Siegel&Sapru, 2010). The anterior commissure is involved in pain sensation, sense of smell and chemoreception and, together with the posterior commissure links the cerebral hemispheres of the brain. It also interconnects the amygdala with the temporal lobes thus contributing to emotion, memory, speech and hearing. The anterior commissure is involved in instinctual and sexual behavior. The stria terminalis is involved in sustained aversive states (as might be associated with stress).

Summary of interpersonal-affective conflict/modulation through amygdalar efferent transmission

Interpersonal-affective information is transmitted to the amygdala via visual (superior colliculus-pulvinar-amygdala subcortical) and auditory (thalamo-cortico-amygdala) as well as from olfactory (afferent) pathways where it is assessed as having/not having survival salience and is accordingly transmitted to the prefrontal cortex, hippocampus and and/or hypothalamus via the stria terminalis, anterior commisure or ventral amygdalafugal (efferent) pathways where the information is further assessed, or acted on respectively as enhancing or threatening to survival.

Interpersonally-affectively attuned and containing experience—such as effective psychotherapy/psychotherapy relationship—is (hypothetically) registered at the amygdala in conjunction with stimulus assessment via the prefrontal cortex and other structures—over repeated exposure—as "safe for survival" resulting in modulated responding over time. It could be said that as the amygdala comes to recognize a familiar, safe stimulus attribute the rest of the system relatively "settles down," psychological defenses are relinquished and symptoms abate.

Specific Disorders and the Amygdala

Amygdalar activity associated with specific disorders has been researched. The present paper looks at some of these findings with regards to Major Depressive Disorder (MDD), Bipolar Disorder and Attention Deficit Hyperactivity Disorder (ADHD). A summary of these below, with expanded discussion later, includes:

Major Depressive Disorder (MDD) and amygdala: Multiple functional neuroimaging studies have shown a hyperactive amygdala in depressed adults (Yang, Simmons, Matthews, Tapert, Frank, Max, Bischoff-Grethe, Lansing, Brown, Strigo, Wu & Paulus, 2010) and depressed adolescents (Yang et al, 2010), albeit, in pediatric studies the results are the opposite, i.e., a hypoactive amygdala in depressed children (Yang, et al., 2010).

Bipolar Disorder (BD) and amygdala: By contrast, in patients with bipolar I and bipolar II disorders, studies show increased amygdalar activity in adults in the manic phase of the illness but decreased amygdalar activity during the depressed phase (Hariri, 2012).

Attention Deficit Hyperactivity Disorder (ADHD) and amygdala: Studies show disrupted connectivity between the amygdala and orbitofrontal cortex, and, possibly compensatory, enlarged hippocampus in individuals with ADHD (Plessen, Bansal, Zhu, Whiteman, Amat, Quackenbush, Martin, Durkin, Blair, Royal, Hugdahl& Peterson, 2006).

Module 5 (AMP Grand Rounds Presentation, June 9th, 2022): Patterns of interpersonal-affective misattunement, defensive structures and the neuroendocrine mediation of disorder

Module 5 of the RPSP series looked at hypothetical continuums of interpersonal-affective experience with neuroendocrine responses and pathways associated with specific disorders. The compelling and intriguing—and, at times seemingly contradictory—findings with regard to the amygdala, its innervations (to and from) other brain areas and disorders were examined toward making sense of research-based physiological findings from a relationally-informed practice perspective.

First, we will look at what affective-defensive patterns associated with specific disorders suggest about interpersonal-affective developmental experience associated with those conditions. Then, we will look at the neuroendocrine responses associated with specific disorders. Then, we will tie the interpersonal-affective component together with the neuroendocrine processes to trace a continuum from relational experience to associated affective-defensive patterns, amygdalar response, and neuroendocrine pathways through to symptom presentation.

"Sketch" Outlines of Attunement/Misattunement and Defensive PatternsPer Disorder (Major Depressive Disorder, MDD, Bipolar Disorder and Attention Deficit Hyperactivity Disorder, ADHD)

Major Depressive Disorder (MDD):
Hypothesized patterns of misattuement (presuming prioritizing of preserving the survival relationship at the expense of access/expression of affects): Child seeks to gratify parent's need for child to serve a role for them. Affects that "push back" against the other (the parent), e.g., anger especially may be met by retaliation by the parent.

Defensive structure: "Blanketing over," or "insulating of" affects.

Countertransference: Sometimes an urge to "extract" affects with a depressed person, i.e., to pull affects to the surface so they can be addressed.

Extrapolated transference: is the individual is expecting the therapist will attempt to pull feelings forth suggesting that, developmentally the individual experienced his or her parent's response to patient's feelings as in order to meet the parent's needs as opposed to the patient's affective needs.

Bipolar Disorder:
Hypothesized patterns of misattunement (presuming prioritizing of preserving the survival relationship at the expense of access/expression of affects): Child aligns with the parent's elevated mood defense in place of the parent attuning with the child's emotional experience.

Defensive structure: "Lofting above" affects. Individual cathects onto elevated mood in place of accessing affects. Given the inflated cognitive associations to elevated mood negative affects are experienced as unimportant reinforcing their repression or dissociation.

Countertransference: An urge or tendency to join patient in his or her elevated state, i.e., collude with the mood.
Transferential extrapolation: Therapist will approve of and join me in this elevated space

Developmental extrapolation: Parent defends with elevated mood also—bipolar has the highest concordance rate of all mental illness, 50%—and reinforces child's shared experience in this which concomitantly reinforces parent's elevated mood.

Bipolar Disorder, Depressed Phase versus Major Depressive Disorder (MDD) Psychoneuroendocrine Discussion

Amygdalar activity is increased in adolescent and adult depressed patients. However, in bipolar patients amygdalar activity is increased in manic phase but decreased in depressed phase. This is consistent with a hypothesis that the amygdala itself isn't registering threat but instead salience. One could hypothesize that potentially dangerous stimuli in a unipolar depressed patient is registered as salience and forwarded to the prefrontal cortex where it is then determined to be (associated with depressed patient's cognitive biases) dangerous to survival (depressed people's "realistic pessimism"). In the bipolar patient, during mania the hyperactivity of the amygdala registers a greater range of stimuli including those biased (again at the prefrontal cortex) as increasing viability. This, hypothetically, is because concomitant with the threat assessment is the manic individual's inflated assessment of self and power. In the depressed phase of the bipolar the amygdala stops registering survival salience in either direction. Instead, there is just a pervasive awareness of vulnerability and powerlessness.

When depressed phases of bipolar disorder are compared with depression in people with MDD, MDD patient's scored higher on all vegetative, autonomic and cognitive symptoms of depression, except one: fear (Hariri, 2012). Bipolar patient's depression was characterized by higher fear than that of MDD patient's depression. Given the bipolar patient's depression is associated with decreased amygdalar activity and the MDD depression with increased amygdalar activity this is consistent with the view that the amygdala itself is not a "fear registry." But, why "more fear" in the bipolar depression with the amygdala "turned off"? A hypothesis consistent with this array of findings is that as the amygdala is less active in registering "survival salience" in bipolar that information about discrete stimuli is not being transmitted to the prefrontal cortex for assessment. Instead, the individual is globally experiencing threat to survival, and, more to the point: vulnerability and powerlessness. Their prefrontal cortex is saying—without recourse to input from discrete stimuli from the environment—"I am—globally—in danger." This would be consistent with an early developmental "attunement/containment" model of affect modulation where, interpersonally-affectively in the attachment relationship maintaining attachment was dependent on the child "joining with" the parent in an elevated—"all is well, we are fabulous [and don't tell me otherwise]"—mood and cognitive state. Such, "joining with the symptoms, i.e., with the mood state" is also consistent with the extraordinarily high rate of family concordance in bipolar. Bipolar has a 50% familial concordance rate: the highest of all the mental illnesses. It's long been suspected this is due to the high learnability of the dramatically impactful symptom presentation in bipolar. The present mind-body model provides a way of looking at the concordance consistent with that view and also with an eye to what is occurring neurologically and cognitively along with these interpersonal-affective events.

That without one's superpowers one is in danger from the environment is also consistent with the increased irritability in bipolar patients whether in the manic or the depressed phase. (This would also explain the sometimes difficult challenge of differentiating generalized anxiety from mania). This would also be consistent with a psychodynamic model (such as that presented here) that the bipolar patient defends against affects with mood itself: "lofting" him or herself above affective experience. When the individual is unable to access a manic mood state he or she is globally threatened by existence; versus, in the MDD depressed person where affects are attenuated through repression or "insulation." The manic

patient has developed an inflated sense of his or her own powers of survival and viability—when activated in the manic state—that the threatening existence "plays no threat" to him or her or even "is an exciting and challenging plaything." However, when the manic phase has passed/been exhausted it is Superman on kryptonite. No special powers to deal with the pervasively dangerous environment. For the MDD patient affects (at the interpersonal-affective level) are pervasively repressed and the emergent cognitions—which help to maintain the repression—are along the lines of "I have inadequate [inadequate access to emotions = inadequate energy = inadequate sense of self] abilities to make this turn out well… and this… and this … and this" and there is, generally reduced motivation, initiative and energy that goes with such a pessimistic mindset. In bipolar depressed phase the individual is not considering his or her inadequacy with regards to any given stimuli but rather pervasively is powerless to preserve him or herself in the face of an onslaught from a dangerous overpowering environment. In cases of more severe MDD we see an "exhausted" presentation more in keeping with that of bipolars in a depressive phase. It will be interesting in future studies to look at amygdalar activity in severe MDD episodes versus moderate and mild cases.

Attention Deficit Hyperactivity Disorder (ADHD):
Hypothesized patterns of misattunement (presuming prioritizing of preserving the survival relationship at the expense of access/expression of affects): Child keeps mind and body in continual motion to ward off affects that threaten the parent-child connection.

Defensive structure: "Keeping body and mind in motion to avoid affects"

Countertransference: Urge to "contain" patient through behavioral control (esp. if child), e.g., "Why don't you sit down so we can talk," as opposed to emotional attunement, e.g., "You are really excited/uncomfortable/agitated right now."

Transferential extrapolation: Therapist will focus on my behavior and attempt to engage me around that.

Developmental extrapolation: Child's shifting attention—and associated shifting behaviors—provided parent a way of responding to the child that didn't require attuning with her or his affects and, in turn requiring the parent's affective awareness (e.g., of his or her own affects).

Hypothesized Misattunent/Defensive Pattern per Disorder with "Sketch" Outline of Amygdalar and Neuroendocrine Pathways Added (MDD and Bipolar Disorder)

If we add the neuroendocrine pathways stemming from the affective-attunement/defensive patterms per each disorder, described above, we get the following.

Hypothesized misattunement pattern in MDD:
Child represses affect so as not to alienate parent with "unacceptable" affects (e.g., anger)

versus

Hypothesized misattunement pattern in bipolar:
Child aligns with parent's manic mood so both can remain "above" affects and maintain connection with each other. When the parent is depressed the child experiences emotional abandonment and alienation from the parent
Amygdalar response in MDD depression:

Amygdala shows *increased* activity during depression. (We know this from previous studies)

Amygdalar response in bipolar *manic* phase:

Amygdala *also* shows *increased* activity (like in the depression of MDD). We know this from previous studies

Amygdala in bipolar *depressed* phase:

Amygdala shows *decreased* activity. (The *opposite* of MDD depression. We also know this from previous studies)

Symptoms of MDD (versus bipolar depression): *All* depression symptoms (e.g., poor sleep, poor appetite, low motivation, low energy) are increased *more so* than in bipolar depression. Only *fear* is greater in bipolar depression. (We know this from previous studies)

Symptoms of BP depression: Only *fear* is increased in bipolar depression more so than in unipolar depression

Hypothesis based on patterns of misattunement: During depressed phase of bipolar disorder connection with the parent (which is based on aligned mania) is lost and patient is helpless (thus he or she feels fear)

Amygdalar and Neuroendocrine Response and Pathways

MDD:
Amygdala:
Prefrontal cortex, hippocampus or hypothalamus:
Hypothalamic Pituitary Adrenal (HPA) axis
Stress pathway we talked about in the earlier lecture
Neuroendocrine changes due to protracted, unresolved emotional conflict (born in misattunement patterns) result in glutamate and serotonin changes in the brain

Bipolar:
Amygdala:
Prefrontal cortex, hippocampus or hypothalamus:
Hypothalamic-Pituitary-Thyroid axis
Increased norepinephrine

MDD and the depressive phase of bipolar disorder are opposite at the amygdala.

Case Example ("Jenna")

With bipolar I have to attune with the elevated mood—within reason—until the attachment feels safe. Jenna has a high-status, high-demand professional job and career. She also ran a sports club as part of her "leisure" activities. However, she was way over-extending herself and this in the context of her very demanding profession. Her irritability, tension and stress were spilling over into arguments, pot-shotting and other interpersonal-communication problems with her boyfriend and making it even more difficult for her to manage her work-related conflicts and stressors. While it was evident she would need to delegate du-

ties of the sports club so as not to jeopardize her career I initially joined with her around the strengthening aspects of her club leadership rather than emphasizing self-restriction (which would have jeopardized the establishing of our relationship as she relied too much on her manic defenses to maintain contact with her developmental attachment figure, unspecified here for reasons of patient confidentiality). Jenna is a highly-competent, achieving professional who was feeling her authority challenged by some of the men on the club on basis of her gender. Her achievement and authority were obviously important to her sense of self and identity. So, I validated her—completely valid—struggle and her stamina and effectiveness here without, initially, much focus on her over-expenditure of energy in general. So, nothing is being "made up" here. When we talk about "attuning with defenses" it doesn't mean we are being false or pretending. It means that the patient is recruiting certain aspects of experience to defend against other aspects of experience, namely against emotional access, and we as therapist are differentially aligning and allying ourselves with the genuinely survival-related elements of experience while maintaining awareness that extensions of these elements are obscuring access to their emotions. (In a sense, one can think of psychological defenses as "artifacts of survival.") Thus, we are genuinely aligned with the patient around the experiences that we show alignment with. But, we also have "an agenda" and that is to ultimately accompany them as they let go of those elements of experience that don't have specific survival value but are there instead to obscure and prevent emotional access. One can see this if one breaks down the elements of this woman's orientation to her role with the sports club: Asserting herself as a leader and asserting the validity of her leadership as a woman in a context where there is some gender bias deserves a "Bravo!" even if her effort may also be associated with over-extension of her energies given her already busy professional life. That is, while there is defendedness against threatening emotional experience inherent in her over-extension she is defending through genuinely good, constructive and healthy activity aligned with a healthy identity and sense of self. However, having to "do every little thing" and being THE ONE responsible for all successes and accomplishments of the team—on and off the field: Unrealistic and socially and interpersonally disconnected and disconnecting as well as exhausting and unhealthy and potentially destructive to other areas of life such as her profession and personal relationships.

As she came to see I was on her side, and genuinely supportive of her constructive social contribution, the challenges and eminence of her leadership and her self-assertion as a woman in face of gender bias—and thus, her key identity elements—she was more able to allow tenuousness around the extent to which she was trying to be a "one-person team" with regards to multiple specific tasks (e.g., contacting club members, arranging club social gatherings and so forth) and she was able to let go of some specific tasks and delegate. Her most basic sense of self and identity was being validated—and thus, contained—by our interpersonal-affective atttunement in the context of an established psychotherapeutic relationship and thus she no longer "needed to do everything" in order to feel her sense of self and identity would remain intact. Essentially, she would "survive and thrive" by doing certain important things without having to "do everything in the world." As this reduction of tension and stress freed up some of her—what Freud would call—"libidinal cathexis" she was able to turn her attention more so to the conflicts in her professional life, her conflicts with higher-ups at her firm and so forth. She now has moved into an even higher-level job in a governmental office, with more responsibility and status but with less demand (s) on her free-time and with far less intra-office conflict. And, she continues in a leadership position with her athletic club but in a much more modulated way with greater sharing of responsibility for tasks. Her irritability and stress are notably reduced and her interpersonal communication with her boyfriend has—on both their parts—become much more receptive, attentive and attuned, much more productive and "give-and-take" without the irritable pot-shotting.

Countertransference and Affective Attunement and Containment

From a relational psychotherapies perspective one of the most powerful and reliable sources of data we have is countertransference. Properly trained and experienced clinicians can draw on sensory-perceptual-cum-amygdalar-cum-neuroendocrine-cum-affective-cum-consciousness responses to infer transferential states of the patient. For example, beginning with the premise that what is healing for my patient is attuning with—and thereby supportively containing—his or her affects in the moment if I experience an urge or impulse to do something else, instead I am experiencing countertransference. A specific example would be working with a depressed patient with markedly flattened affect, e.g., no facial expression, pronounced psychomotor retardation, monotone speech, noncommittal. I find myself having the association, "Accessing what this person is experiencing, emotionally is like 'pulling teeth,'" and I feel an urge to elicit patient's affects as opposed to just staying with the patient and his or her experience in that moment (while maintaining a cognitive awareness of the discrepancy between patient's flat affective presentation and situational factors and content thereby preserving awareness of the unexpressed affective component as well).

We have to keep in mind here, in order to understand our countertransferential response we have to take into account that affective attunement is intrinsically bound up with attuning with defenses. That is, "getting" my patient's experiences means both awareness of and having a sense of their affective experience but also their need to stay somehow remote from their affects (e.g., repression, denial, dissociation). So, if I am trying to elicit affects in a patient who is markedly opposed to accessing his or her affects I am only attuning with part of his or her affective experience—the unexpressed affect itself—without attuning with, or "getting" his or her need to stay remote from the affect (at least in the present moment). Accessing the affects will come later when, through consciously attuning with the defenses the patient develops trust I will not try to push him this way or that and this will spontaneously allow emergence of the affective experience itself in the context of the therapeutic context and relationship.

From this awareness of my countertransferential urge—i.e., to elicit affects—I increase awareness of my patient's transferential expectation that I will invalidate his or her affective needs through judging his or her affective response. This countertransferential finding is consistent with what we know from the psychodynamic literature on developmental experiences of depressed people and where the—albeit over-simplified and rather limited, though essentially correct in direction—formulation of "anger turned inward" comes from. We know now that not only judgmental or critical (so-called "superego") responses to anger are developmentally associated with depressed or "dampened down" (or flattened) affect but more generally, critical responses to affective expression in general. (Though anger may be particularly problematic in the attachment relationship because it can be more aversive if it is experienced as "directed at" the attachment figure). (CBT therapists see these critical responses in patient writing exercises replete with self-critical statements attacking self-esteem where affects have become identified with self alone uncoupled from the invalidating attachment relationship). I shared with you in a previous presentation the case of Eric who had to leave college because of the severity of his depression to the point of muteness, confusion and severe regression. He was "wandering about campus in a daze." In this situation, his parents were very supportive and loving of him but had strong admonitions against the expression of (so-called) negative emotion. Treatment meant long periods of just "being with" Eric and his muteness and his regressed state, aware of the presence of profound affects behind the flatness and the regression and the confusion while remaining conscious of the countertransferential urge to elicit affects and abstaining

from being overly proactive with regards to eliciting affects in deference to building the therapeutic rapport. This ultimately resulted in his, tentatively at first but increasingly over time, expressing his feelings, becoming more organized and working through life-long barriers to access increased motivation, reconnection with his loved ones and with the world, and awakening of goals more in keeping with his actual needs and wants, working at two jobs he liked and returning to school and a program of study more in keeping with his actual interests and career goals.

There are many instances where countertransference awareness can inform us about our patient's experience and produce hypotheses for further exploration into the developmental and situational underpinnings of our patient's affective response. Clinical experience itself shows us that (informed) data produced by actual practice—i.e., empirical data—is generally most useful in actual practice with any given patient. However, population data (often called empirical data although, in actuality it is "twice-removed" from experience—i.e., looking at grouped and averaged responses instead of an actual patient's response and assessed by instruments as opposed to direct experience) is also useful in a couple of ways: 1) It is expected by many in the clinical as well as academic community. Psychologists are scientists as well as practitioners and, as such we are trained to integrate population findings with our practice findings; 2) it provides a degree of generalizability. Given the extensive individual differences between human beings (versus objects of study of other sciences, e.g., rocks in geology or star masses in astrophysics) generalizability of psychological population data is always limited. However, when enough commonalities stack up over time it becomes evident that there are tendencies or trends toward clustering of variables and factors in human response that guide us in our analyses of patient and patient-therapist dynamics and in formulation of intervention. Ultimately, we have to adjust our—population-based—assumptions and interventions to attune with our individual patient's actual experience and needs. But, generalized findings can help to move us in the direction of some sort of ordering and organizing of what we are experiencing of our patient's experience.

A population study investigating the continuum of patterns of misattunement and defensive structures (such as described in the MDD and Bipolar outlines presented earlier and depicted in the case example drawing on countertransference and other practice data above), would include direct observation of babies and very young children in the presence of affective stimuli and their parents, quantified observer-reported measures of affective expression and verbal behavior (of both child and parent) taken together with unstructured verbal interviews of parents (and verbal children) with quantification of key indicators of affective acceptance, validation, attunement, misattunement and invalidation. Data from these measurements could show correlations between parent affective and verbal response to child affective expression and degree of child affective expression. (Similar studies have been conducted by Daniel Stern, Beatrice Beebe and others looking specifically at parent-child affective attunement.) The information could be extended longitudinally to investigate correlations between parent-childattunement/misattunement, child affective expression, mood and presence/absence of mood disorder. These findings could be extended to explore relationships between child affective expression, parental affective response, behavioral and verbal response, mood and mood disorder and amygdalar response. Amygdalar response could be measured by cerebral blood flow to/from amygdala in the presence of affective stimuli. There are existing multiple studies looking at amygdalar response in mood disorder (MDD and bipolar depressed and manic phases). A study such as that described above would extend these findings to the interpersonal-affective patterns between parent and child in the presence of mood problems and associated amygdalar response.

Module 6 (August 2022): Exploratory Board Meeting

Module 6 was an explorational meeting with the ABMP board to discuss the role of RxP in an integrated medical psychology model. The relevance to development of the RPSP model is in the extent to which a psychologically-based, integrated model of interpersonal-affective and other psychological factors with biological-based factors can contribute to optimization of RxP and the RxP movement.

Module 7 (AMP Grand Rounds, October 2022): Special presidential initiative: Changing of the Guards: Medical Psychology's Intrinsic Leadership Readiness in a Leaderless Integrated Healthcare System

The more practicing psychotherapists attend to the relationship between interpersonal-affective factors and downstream events—e.g., neuroendocrine events and biological change—resulting from our psychotherapeutic interactions the better able we are to assert our role in treatment and the more targeted and nuanced our interpersonal-affective interventions potentially become. This is especially relevant when recent studies are showing the salience of biological change in psychotherapy treatment outcome.

The focal, nuanced—atomistic—component of relational intervention, affective attunement, and the associated intrapsychic-emotional transformation that occurs with that—affective containment—are at the heart of the healing effect that is the heart of treatment: the doctor-patient relationship. Interpersonal-affective attunement and interpersonal-affective containment are the processes by which our patient comes to experience a different relationship with the affective experiences that underlie his or her symptoms; symptoms that emerged via the defensive structures that grew up around affectively-misattuned attachment experiences.

In previous sections we looked at the implicit associations between interpersonal-physiological homeostatic processes and the interpersonal-affective attunement and containment processes that Stern outlines and what I call the intrinsic "yoking" of these processes. This yoking of interpersonally-regulated physiological processes and interpersonal-affective attunement and containment highlights the importance of relational approaches in mind-body models, especially those where interpersonal-affective events affect our physiology.

<u>The psychological-physiological continuum and the politics of healthcare</u>:
In my forty years working with patients I have been a consistently effective therapist (as based on patient outcome, patient feedback and peer feedback and performance evaluations when working in institutional settings). I have worked with patients in rural and urban environments, inpatient, outpatient and residential settings. I have worked extensively with patients in almost every diagnostic category from severely mentally ill—schizophrenic, schizoaffective, mood disordered psychotic—and severely personality-disordered (e.g., institutionalized borderline and antisocial) patients, criminal justice and forensic patients all the way through to the relatively much higher functioning patients I work with in my private practice. I have been consistently rewarded in my work with my patients enjoying their progress and recovery (goals adjusted for severity of illness) based on my own observation, collegial and supervisory feedback and—most importantly—observed patient change and patient feedback. My private practice is always full. I have almost complete retention throughout course of therapy to completion of therapy goals. I have never spent one cent advertising. I am overworked as it is. I believe these described experiences are true of many of my clinical and medical psychological colleagues, as well, who work primarily via psychotherapeutic modalities with heavy attention on the doctor-patient relationship and with formal technique and medication secondary—and adjunctive—to this emphasis.

The reason I express this is not idle trumpeting of myself and my clinical and medical psychology colleagues. It is to make the point that mechanistic, medical perspectives on, and approaches to treatment are neither necessary nor optimal where healing is primarily a relational event. At the same time I am *not* saying that formalized technique and medications do not have a place in treatment. The key is that they are included and applied *in a relational—integrated—context*. That is, when, for instance we prescribe a medication it should be in the context of our awareness of our patient's needs and expectations, including what they need from us as their doctor and their need to have their suffering and struggles—and the need for relief there from—empathized with and understood.

A classic trope in my practice oft repeated that typifies the theme of this talk is the multiple patients who, on initial presentation said to me something on the order of, "I went to this doctor and he prescribed this antidepressant. Then I went to that doctor and she took me off that antidepressant and put me on this one. Then she added this one. Etc. Now I would like some help with my depression." Then, in by far the majority of the cases, the individual starts to work in psychotherapy with me, their depression improves, they forget they were depressed and now are addressing relational or other life conflicts that were underlying to begin with and generally traceable to the interpersonal-affective developmental problems interacting with their current relational and other life situations as described above.

As we enter the third decade of the 21st century we are confronted with the extensively multifaceted entity that healthcare has become. There are endless new technologies, new medications and new psychotherapies to choose from in treating illness. The number of specialties in psychology, medicine and other health professions is difficult to count and catalogue at this point. And, any given patient with a given disorder may be confronted with a program of treatment that includes multiple treatments and doctors sometimes with little awareness of one another and often including what feels very much like "a la carte" interventions. This results in patients experiencing inconsistent and sometimes discontinuous healing processes and, often times, a sense of unmooredness as their multiple healthcare providers are often not well-aware of what their other providers are doing. In many cases a given provider might be barely aware of the presence or role of the other involved providers.

A core problem from which this state of affairs has emerged is a move away from a primarily relational perspective on treatment and recovery to a mechanistic and material (e.g., medications, formalized treatment protocols) perspective. Relational factors—and the containing effect on the patient's struggles and the treatment and healing process, itself, associated with the doctor-patient relationship—have been eschewed for *things* and *mechanisms*. As such, what is supposed to be becoming integrated care is in fact more kaleidoscopic or divided, multiple provider care with little actual integration included. What is needed are professionals well-versed in the "things and mechanisms" who are also well aware of, versed in and grounded in the role, practice and experience of the doctor-patient relationship at the heart of the healing process. Medical psychologists possess this training and awareness and are ready to step into this vacated role at the head of contemporary integrated care.

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A Case for Nutrition Training in Medical Psychology

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Abstract

There has been a surge in interest in nutrition treatments for mental health in recent years. Nutrient deficiencies can present as mental health symptoms, perhaps earlier than body symptoms. Many studies attempt to cure physical disorders using nutrients as treatments; when such approaches fail to reverse years of nutrient deficiency it gives he false impression that nutrients do not belong in medical practice. Nutrients are not drugs; they may slow or halt progression but, like pharmaceuticals, they do not reverse major damage.

This report outlines some of the causes of nutrient deficiencies and presents links between specific nutrients and mental health symptoms. It explores how adequate nutrition is dependent not only on dietary choices but also on the quality of the foods available, absorption issues, medications taken and the genetics of the individual. An overview of genetics and how genetic alleles can affect nutritional status is presented. Specific nutritional issues impacting mental health are reviewed and the most bioactive forms of vitamins are identified in order to guide the clinician in nutritional recommendations.

Introduction

Nutritional treatments are being hailed as "The Next Frontier in Psychiatry"[1]. Seldom a day goes by without a journal study being published on how nutrient deficiencies affect mental health. There has been an exponential surge in interest: PubMed lists only 84 journal articles on the subject in the year 2000; 242 articles in 2010, 777 results for 2015 and 1985 in the last 12 months[2]. This "rediscovery" offers hope for a field too long dominated by pharmaceuticals which, in hindsight, only put a band aid on symptoms and offered no prevention or cure.

Western medicine concerns itself with treatment of diseases and their symptoms primarily using pharmaceuticals. This model can be effective at symptom control although it is seldom a cure (at least at this moment in time) for most disorders. This inarguably is a benefit to sufferers, but drugs rarely accomplish anything but symptom suppression. Even antibiotics do not completely cure a bacterial infection, but rather weaken and reduce numbers of bacteria, allowing your immune system to effect cure[3].

Studies with an expectation of a nutrient curing a disorder are often misguided and poorly designed; no one should expect mega-doses of thiamine, for example, to magically “fix” a Korsakoff's patient, yet this approach is common practice[4]! Nutrition is not considered medicine in the allopathic sense, even though the vast majority of pharmaceuticals are plant derived[5]. The allopathic model does not have a clear focus on prevention, and because of this mind set many studies manage to get published in medical journals that confuse nutrition with treatment. There are limited studies demonstrating improvements in health conditions with application of mega-doses of particular nutrients, however. Many other published studies fail to show a benefit when nutrients are used as curatives, and may give the public the false impression that dietary recommendations are at best unreliable and at worst useless.

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What is nutrition?

"Nutrition is the sum total of the processes involved in the taking in and utilization of food substances by which growth, reproduction, repair and maintenance of the body are accomplished. It involves ingestion, digestion, absorption and assimilation[6]."

Nutrition is the study and application of the use of all of the substances that make up the diet, including vitamins, minerals, fatty acids, fiber and proteins. It also includes the study of the factors that can affect the absorption and utilization of these substances.

"Malnutrition due to lack of vitamins and minerals has gone virtually unnoticed. The hidden hunger of malnutrition affects an astonishing 1 in 3 people worldwide, according to the Micronutrient Initiative. Lack of key micronutrients, especially in the first 1000 days of life (from conception to the second birthday), results in adverse effects to cognitive and physical development as well as a reduction in immune function[7]."

Mental symptoms cannot be separated from physical symptoms. We may experience a change in mood or cognition as an early sign of a nutritional deficiency which may later develop into a "disease." For example, depression, irritability, anxiety, restlessness, insomnia and impaired concentration (sufficient to warrant a diagnosis of "Major Depressive Disorder") may be indicators of a B12 deficiency or other health imbalance. If left untreated a B12 deficiency may result in irreversible dementia[8]. Alternately, these could be early indicators of a thyroid disorder. Since a thyroid panel is not part of a routine medical work up the condition could be missed, and the sufferer could spend decades having their thyroid symptoms being treated only with an "anti"depressant[9].

Why this important to medical psychologists

In my opinion psychologists, and particularly medical psychologists, are the best choice to look for possible nutritional issues and early signs of physical dysfunction in our patients. Medical and clinical psychologists use a different approach than allopathic physicians. We are the detectives of mental health; we look for causes, the WHY, rather than trying to treat symptoms. We interpret these clues and develop treatment strategies to bring about very real change.

Knowledge of the effect of nutritional influences is vital if we are to do an adequate job of helping our patients. Nutritional investigation should be a part of every psychological work up, for several reasons:

1. Nutritional deficiencies often present as mood and cognition dysfunction, and these symptoms may appear well before more physical symptoms or a physical diagnosis.
2. We do not have the degree of time limitations on our sessions, compared to physicians, particularly under managed care.
3. Our patients hold our profession in high regard and give us a level of trust equal to or exceeding any other health professional.

This is not a call for psychologists to help our patients with diet and meal planning, but rather for psychologists to consider all of the factors that influence mental health. It is a call for Medical Psychologists to embrace science, to develop expertise, and as a minimum to understand these factors and refer to specialists when appropriate.

Nutrient deficiency and common mental health diagnoses

The National Institutes for Health recognizes that nutrient deficiencies affect mental health and may drive psychiatric syndromes[10]. A 2016 report Nutritional Factors Affecting Mental

Health found that "Dietary intake and nutritional status of individuals are important factors affecting mental health and the development of psychiatric disorders. Majority of scientific evidence relating to mental health focuses on depression, cognitive function, and dementia, and limited evidence is available about other psychiatric disorders including schizophrenia.[11]"

A PubMed review of nutrients and mental health uncovers a surprising number of nutrients that have substantial research to support this hypothesis12 13 14 15 16 17 including:

Vitamins: A, B1, B2, B3, B4, B5, B6, B7, B8, B9, B12, C, D, E.

Amino acids: alanine, arginine, asparagine, aspartic acid, carnitine, choline, citrulline, cysteine, glutamic acid, glutamine, glutathione, glycine, histidine, homocysteine, isoleucine, leucine, lysine, methionine, ornithine, phenylalanine, selenocysteine, serine, taurine, threonine, tryptophan, tyrosine, valine.

Minerals: calcium, chromium, cobalt, copper, iodine, iron, lithium, magnesium, molybdenum, potassium, selenium, vanadium, zinc.

Miscellaneous: Omega 3, Alpha-lipoic acid, coenzyme Q10.

With the exception of nutrients included in the NHANES studies[18] and the NIH Fact sheets, the prevalence of deficiencies of these nutrients in the general population is not widely recognized, although many deficiencies with the most common mental diagnoses have been misdiagnosed. Many substances necessary for health are not labeled as “essential” nutrients, presuming that all persons have such a perfect genome and gut flora. We know this is just not so; substances such as the chemical folic acid cannot be metabolized into useful forms due to variations in the MTHFR gene.

This is not to say that nutritional deficiencies are solely responsible for mental health symptoms (although they can be); certainly "Depression,” "Grief" and "Anxiety" are very real diagnoses which are caused by and effectively treated with psychotherapy. The symptoms of these disorders are, in my opinion, very often driven by physical factors. We know from many studies that depression, grief and anxiety can have physical effects on the brain and body, and can cause endocrine shifts that result in nutrient deficiencies. Knowledge of these effects allows us to more completely treat our patients, possibly speeding up change or avoiding misdiagnosis. It allows us to refer to appropriate specialists or provide nutritional guidance if that falls within our specialized training. It falls naturally within our detective role.

“We can get everything we need from diet,” but DO we?

This sounds reassuring, however it is true for only a very few of us, those with “perfect” genes! Several factors are at play that challenge this assumption:

Quality of food

The nutrients available in our food have declined sharply; we no longer get the same vitamins, minerals and amino acids in our food as before. A study published in the British Food Journal found "statistically significant reductions in the levels of Ca, Mg, Cu and Na in vegetables and Mg, Fe, Cu and K in fruit." over a 50-year period. “Efforts to breed new varieties of crops that provide greater yield, pest resistance and climate adaptability have allowed crops to grow bigger and more rapidly, “but their ability to manufacture or uptake nutrients has not kept pace with their rapid growth.” There have likely been declines in other nutrients, too, he said, such as magnesium, zinc and vitamins B-6 and E[19].”

A study of the mineral content of 27 varieties of vegetables, 17 varieties of fruit, 10 cuts of meat and milk and cheese products over a 51-year period (1940-1991) found: "The results demonstrate that there has been a significant loss of minerals and trace elements in these foods over that period of time[20]."

Dietary inadequacy (what we eat)

The National Academy of Medicine establishes Recommended Dietary Allowance (RDA) and Estimated Average Requirement (EAR), the average daily level of intake sufficient to meet the nutrient requirements of nearly all (97–98%) healthy individuals; often used to plan nutritionally adequate diets for individuals. They also list Adequate Intake (AI); intake at this level is assumed to ensure nutritional adequacy, used when evidence is insufficient to develop an RDA.

The U.S.D.A. tracks nutrient intakes for a number of essential vitamins, minerals and fatty acids by a number of factors including age and gender. This data is compared to the Estimated Average Requirement (EAR), which is the average daily nutrient intake level that is estimated to meet the requirements of half of healthy individuals. The findings are reported in the National Health and Nutrition Examination Survey (NHANES) report “What We Eat in America.” The 2010-2018 survey found significant deficiencies among nearly all age groups[18]. The following vital nutrients, their EAR (or AI), and percentage of women age 51-70 who are deficient in these nutrients (partial list):

Table 1 Nutrition Adequacy in Women 51yr+		
	EAR, AI	% Deficient
Protein (g/kg bw)	0.66	8%
Fiber gm	21	18%
A mcg	500	41%
Thiamin B1 mg	0.9	12%
Riboflavin B2 mg	0.9	3%
Niacin B3 mg	11	4%
B6 mg	1.3	27%
Folate B9 DFE mcg	320	26%
Choline mg	425	93%
B12 mcg	2	9%
C mg non-smokers	66	41%
C mg smokers	95	93%
D mcg	10	>97%
E mg	12	86%
K mcg	90	61%
Calcium mg	1000	75%
Magnesium mg	265	49%
Iron mg	5	<3%
Zinc mg	6.8	17%
Potassium mg	2600	36%
Source: What We Eat in America [12]		

Medications that increase nutrient need

Many drugs decrease nutrient absorption or interfere with their utilization. Several increase,demand for certain nutrients with metabolization[21,22]. Supplements are appropriate and should be recommended, and some of these are critical. Examples include:

- ACE inhibitors: zinc
- Alcohol: Vitamins A, B1, B2, B6, B9
- Antacids: Vitamin B9, fluoride, iron, magnesium, manganese, phosphate
- Antipsychotics: Vitamin B2, prolactin
- Aspirin: Vitamins C, E, calcium, iron, magnesium, zinc
- Benzodiazepines: Vitamins C, D, calcium
- Beta blockers: CoQ10
- Carbamazepine: Vitamins B7, B9, calcium
- Chlorpromazine: Vitamin B2
- Cholestyramine (Questran, others): Vitamins A, B9, B12, D, E, K, calcium, magnesium, zinc
- Corticosteroids: calcium, potassium
- Digoxin: calcium, magnesium,
- H2 receptor antagonists: Vitamin B12, calcium, iron
- Levodopa: Vitamins B6, B9, iron
- Levothyroxine: calcium, iron
- Lithium: Thyroid hormones, Vitamin D
- Loop diuretics: Vitamin B1, magnesium, potassium, zinc.
- Metformin: Vitamin B12
- Methotrexate: Vitamin B9
- Phenytoin: Vitamins B1, B6, B9, D, K, calcium
- Potassium sparing diuretics: Vitamin B9, phosphate, zinc,
- Thiazide diuretics: calcium, magnesium, potassium, zinc
- Proton pump inhibitors: Vitamin B12, calcium, iron, phosphate, magnesium
- Oral contraceptives: Vitamins B2, B6, B9, B12, C, E, magnesium, selenium, zinc
- Tetracycline antibiotics: calcium, iron, magnesium, manganese, zinc
- Statins: CoQ10
- Valproic acid: carnitine
- Verapamil: calcium
- Warfarin: Vitamins C, E, K, calcium

Absorption and utilization

Placing the food in your mouth is not the end of the story. Utilization of a nutrient has a host of dependencies. Vitamin A serves as a good model to investigate. Preformed vitamin A is found in fruits and vegetables as beta-carotene. Vitamin A is necessary for the maintenance of normal vision, enhancement of growth, tissue differentiation and reproduction. High doses of vitamin A itself can have negative outcomes, including death.

Natural sources of beta carotene include over 600 compounds. Beta carotene is highest in baked sweet potatoes and carrots. These natural sources must go through an extensive

process for utilization. Because of the overdose risks of ingesting vitamin A retinol directly, vitamin A is seldom included in supplements, but rather is supplied as a beta carotene compound. The beta carotene in supplements is mainly produced through chemical synthesis. Synthetic beta carotene is much less complex, however, and natural compounds have significantly higher bioaccessibility [23] .

Absorption of beta carotene has been found to be dependent on a host of factors, including concentration in food, chewed particle size, stomach pH, presence of oxidizing compounds including iron, availability of gastic lipase. Once in the small intestine bile acids, free fatty acids (FFAs), mono- and di-acylglycerols and phospholipids further aid in micellization. Intestinal uptake depends on an intracellular ß-carotene transporter, with influence on the SRB1, ABC, NPC1L1 and CD46 genes. An excellent description of this entire process can be found in a paper by Bohn, et al. [24]

Utilization of all essential nutrients (with the exception of water!) must go through similar processes. Non-essential (and "conditionally essential") nutrients are derived from these basic molecules, but require even more extensive processing. The amino acid glycine serves as a particularly useful model.

Several small amino acids, including glycine, serine, and cysteine, are critical for life. Glycine deficiency has been linked to neural tube defects, mental retardation, epilepsy, cancers, obesity, cardiovascular disorders, and restless leg syndrome. It is the primary amino acid in collagen synthesis. Glycine acts as precursor for several key metabolites of low molecular weight such as creatine, glutathione, purines, and porphyrins. Glycine is the primary inhibitory neurotransmitter in the peripheral nervous system and is a cofactor in release of GABA [25]. A PubMed search of glycine shows associations with anxiety, depression, sleep disturbance, ADHD, bipolar disorder, OCD, schizophrenia, dementia, epilepsy and mental retardation. Orthomolecular psychiatry has long advocated glycine, in the form of trimethylglycine, for treatment of schizophrenia and other mental disorders [26]. Glycine is added to nearly all commercial animal feeds (along with lithium) as a necessary ingredient for health and growth.

PubMed lists 3135 studies referencing glycine just in the last year. Don't expect drug sponsored journals such as JAMA to include findings, as pure free form glycine costs less than$13 per pound on Amazon.

For many years glycine was classed as a non-essential amino acid, meaning that many believe we produce sufficient amounts endogenously from other nutrients. In recent years it has been reclassified as conditionally essential, meaning that many individuals do not have all their needs met this way. Glycine is the smallest amino acid, and the slowest absorbing. It has no L or D chemical configuration. It is synthesized in the body through 3 pathways, from choline, threonine, and from serine [27]. Although these nutrients are available from diet, the conversion process depends on several enzymes, all of which are produced under direction of RNA. Choline is converted to betaine by betaine aldehyde dehydrogenase and choline dehydrogenase. Other pathway branches utilize sarcosine dehydrogenase, betaine-homocysteine methyltransferase as a methyl donor and converting homocysteine into methionine, and dimethylglycine dehydrogenase. Threonine synthesis depends on threonine dehydrogenase. Serine conversion requires serine hydroxymethyltransferase (SHMT). SHMT is dependent on availability of sufficient vitamin B6 and folate.

Nutrition and genetics

Production of all of these enzymes is dependent on an individual having "perfect" genes, a model that science tells us is highly unlikely, if not impossible [28]. A 2020 study sequenc-

ing 929 individuals' genomes found 67.3 million single nucleotide polymorphisms, 8.8 million small insertions or deletions, and 40,736 copy number variants [29]. This count included hundreds of thousands of variants that had not been discovered by previous sequencing efforts.

Genetic mutations appear to play a large part in many diseases. We have found heritability patterns in nearly all of the "mental disorders" listed in the DSM. Genetics appears to play a significant part in mood, cognition and behavioral symptoms; gene abnormalities should be suspects whenever we see physical or mental distress.

Instructions for production of the many enzymes and other endogenous nutrients are encoded in DNA. DNA is a molecule in the shape of a double helix, a spiral ladder. Each rung of the spiral ladder consists of two paired chemicals called nucleobases. There are four types of nucleobases: They are adenine (A), thymine (T), cytosine (C), and guanine (G). Adenine and guanine are derived from the nucleotide inosine monophosphate (IMP), which in turn is synthesized from a pre-existing ribose phosphate through a complex pathway using atoms from the amino acids glycine, glutamine, and aspartic acid, as well as the coenzyme tetrahydrofolate in a process called one-carbon metabolism.

Every human has around 20,000 genes and 3,000,000,000 bases. Within our cells, ribosomes facilitate translation of DNA into RNA, which acts as a messenger carrying instructions from DNA for controlling the synthesis of proteins. Both the composition and shape of the protein affect the function of the protein. Proteins catalyze the vast majority of chemical reactions that occur in the cell. They provide many of the structural elements of a cell, and they help to bind cells together into tissues.

Changes can occur in genes because of heredity mutations or acquired mutations. Gene mutations have varying effects on health, depending on where they occur and whether they alter the function of essential proteins. Hereditary mutations, called germline mutations, are those present in parents' egg or sperm cells. Acquired mutations are those that arise during embryonic development or at some time in a person's life. Genetic mutations are called alleles.

In order for an embryo to develop normally, the mother must have sufficient availability of the raw materials necessary including glycine, glutamine, and aspartic acid, and tetrahydrofolate. Glycine may be deficient due to genetic alleles in the DNA responsible for producing betaine aldehyde dehydrogenase, choline dehydrogenase, sarcosine dehydrogenase, betaine-homocysteine methyltransferase, threonine dehydrogenase or serine hydroxymethyltransferase. Sufficient vitamin B6 and B9 (folate) are also required.

Natural sources of B6 are primarily as pyridoxine, a form also used in most supplements. Pyridoxine doesn't have a direct role in human health other than to be converted into pyridoxal, the most bioactive form being pyridoxal 5' phosphate (PLP). This conversion is dependent on pyridoxine 4-oxidase, a gene-dependent conversion. High levels of pyridoxine ultimately limits the amount of pyridoxal 5`-phosphate, which ultimately results in symptoms of Vitamin B6 deficiency [30]. This is problematic in strict vegetarians and those without a "perfect" pyridoxine 4-oxidase gene.

Lack of availability of sufficient folate may be the most common cause of embryo development and mental health problems. The U.S. government mandated addition of folic acid to cereal grains in 1988. An unfortunate coincidence, discovery of the MTHFR gene, occurred in the same year. Folate is required for the body to make DNA and RNA and metabolize amino acids necessary for cell division. Adequate folate is necessary for fetal

development, the most well-known being neural tube defects. Hereditary folate malabsorption (HFM) is an inherited disorder of folate transport characterized by a systemic and central nervous system (CNS) folate deficiency manifesting as megaloblastic anemia, failure to thrive, diarrhea, oral mucositis, immunologic dysfunction and neurological disorders.

Evidence continues to mount that many cases of autism and schizophrenia may be partially or completely due to lack of availability of 5-methyltetrahydrofolate (natural folate). This has been traced to the destructive nature of the 677C MTHFR allele. With this defect, a synthetic form of folate, folic acid, cannot be converted to true folate. The synthetic form reportedly saturates the folate receptors with this particular allele, which means that nomal food sources cannot supply enough folate [31,32,33]. The “work around” for the C677T allele, according to many reports, is to avoid folic acid (although some exposure is certain due to government fortification regulations) and to take very large doses of natural folate, 2400 mg per day, to overcome receptor resistance.

Although somewhat less destructive, the A1298C allele also renders folic acid supplementation to be nearly useless. Many experts recommend a dose of 800 mg per day of natural folate to supply enough of this essential nutrient. This is more than twice that contained in most natural B complex supplements. Most research and interest articles that you read incorrectly refer to folate as folic acid. There is no such thing as a folic acid deficiency, any more than there is such thing as an actual chocolate deficiency.

What forms of vitamins are best?
As shown above, every person has a unique genetic profile for absorption and utilization of nutrients. It seems best that everyone selects only the most bioavailable supplements, rather than submitting to a large assortment of lab tests of questionable validity. What follows is an overview of the most common nutrients and their bioavailablity:

Vitamin A (retinol): Vitamin A occurs as two principal forms in foods: A) retinol, found in animal-sourced foods, either as retinol or bound to a fatty acid to become a retinyl ester, and B) the carotenoids alpha-carotene, ß-carotene, gamma-carotene, and the xanthophyll beta-cryptoxanthin (all of which contain ß-ionone rings) that function as provitamin A. There are no limiting mechanisms for regulating retinol absorption; too much retinol can be harmful or fatal. Over 600 genes are involved in vitamin A processes [12]. Beta-carotene in many supplements is produced through chemical synthesis. **natural, mixed carotenoids** have been shown to be substantially more bioavailable, and are a better choice. Some individuals may lack the genetic alleles necessary to convert carotenoids to retinol, and for those individuals retinol itself may be needed; do so with proper evaluation and symptoms of severe deficiency, backed by lab testing.

Vitamin B1 (thiamine): Most supplements contain thiamin mononitrate and thiamin hydrochloride, a water-soluble form that has a short half life in the body. A synthetic form of benfotiamine, is fat soluble and helps maintain more consistent levels. This form is significantly more bioactive, and is being researched to treat diabetic polyneuropathy (moderate evidence) [34]. **Benfotiamine**, the preferred supplement, is available OTC.

Vitamin B3 (niacin): Dietary precursors of nicotinamide adenine dinucleotide (NAD), including nicotinic acid, nicotinamide, and nicotinamide riboside, are collectively referred to as niacin or vitamin B3. The most bioactive form of niacin is **niacinimide**, which is available OTC. Inositol hexanicotinate is sold as “no flush” niacin. It may not be as effective as niacinimide, which also causes less flushing than niacin.

Vitamin B4 (choline): B4 is not considered a "true" vitamin. Although confusion exists, for our purposes it is choline, an essential nutrient and an important source of methyl groups. Although choline can be produced endogenously in small amounts more is needed from food or supplements. Choline is available phosphatidylcholine and sphingomyelin as well as the water-soluble compounds phosphocholine, glycerolphosphocholine, and free choline. Choline supplements are available as natural choline from egg yolk phospholipids, as choline bitartate, as citicoline, and as Alpha-GPC (choline alfoscerate). **Alpha-GPC** is the most efficient form for transport across the blood-brain barrier [35], and is the preferred form.

Vitamin B5 (pantothenic acid): Pantothenic acid is available in dietary supplements containing only pantothenic acid, in combination with other B-complex vitamins, and in some multivitamin/multimineral products, as pantethine (a dimeric form of pantetheine) or more commonly, calcium pantothenate. No studies have compared the relative bioavailability of pantothenic acid from these different forms [12].

Vitamin B6: As discussed above, natural sources of B6 are primarily as pyridoxine, a form also used in most supplements. Pyridoxine doesn't have a direct role in human health other than to be converted into pyridoxal, the most bioactive form being **pyridoxal 5' phosphate** (PLP), which is the preferred supplement.

Vitamin B7 (biotin): Biotin cannot be synthesized by human cells but is produced by bacteria in the large intestine. As such, antibiotic treatment may disrupt availability.The majority of biotin supplements are synthetic and manufactured by chemical synthesis with crude oil as the main source of raw material. This source may not be displayed on the label. **Natural biotin** is available OTC and may be the best choice.

Biotin supplements may interfere with lab tests that rely on the streptavidin–biotin system. Counsel your patients that they MUST stop all biotin containing supplements a minimum of 3 to 7 days before getting tests for thyroid labs, sex hormone panels, parathyroid hormone (PTH), vitamin D levels, natriuretic peptide tests (BNP, NT-proBNP) for congestive heart failure, or Cardiac Troponin T, commonly used to diagnose heart attack. This last test is commonly used in hospital emergency rooms to diagnose a heart attack as opposed to an anxiety attack, which mimics symptoms. Tell patients to be sure to inform the appropriate physician of their biotin status if they seek help for heart attack symptoms.

Vitamin B8 (myoinositol): Inositol is a carbocyclic sugar that mediates cell signal transduction in response to a variety of hormones, neurotransmitters. It can be produced endogenously from glucose, so is not considered a true vitamin. Conversion relies on glucose-6-phosphate through enzymatic dephosphorylation, again dependent on perfect genes. Look for **myoinositol** as the preferred form.

Vitamin B9 (folate): As discussed above, adequate folate intake is essential for health. The synthetic, folic acid, is converted effectively in many people, although continuing research on MTHFR alleles confirms that the natural for of folate, **5-methyltetrahydrofolate**, is the only low risk form. I counsel my patients to NOT use folic acid or supplements containing it.

Vitamin B12: Another vital nutrient. Methylcobalamin and 5-deoxyadenosylcobalamin are the metabolically active forms of vitamin B12. However, two others forms, hydroxycobalamin and cyanocobalamin, become biologically active after they are converted to methylcobalamin or 5-deoxyadenosylcobalamin in those with perfect genes [12]. Sublingual forms are best, as gut absorption is dependent on too many factors. I recommend Superior Source **methycobalamin** as the best choice.

Vitamin C (L-ascorbic acid): Vitamin C is water soluble and is not stored in adequate amounts in the body. Supplements include sodium ascorbate; calcium ascorbate; other mineral ascorbates; ascorbic acid with bioflavonoids; and combination products, such as Ester-C®, which contains calcium ascorbate, dehydroascorbate, calcium threonate, xylonate and lyxonate. Natural and synthetic L-ascorbic acid are chemically identical, and there are no known differences in their biological activity. An **extended release vitamin C** is preferable. the Presence of bioflavinoids does not appear to increase bioavailabilty 36.

Vitamin D (calciferol): Vitamin D is a fat-soluble vitamin that is naturally present in a few foods, added to others, and available as a dietary supplement. It is also produced endogenously when ultraviolet (UV) rays from sunlight strike the skin and trigger vitamin D synthesis. The most common supplement forms are **D2 as ergocalciferol** which is derived from plants and **D3 as cholecalciferol** which comes from animals. D3 is slightly more bioactive, although choice comes down to preferred diet. The liver metabolizes vitamin D3 to **25-hydroxyvitamin D (25OHD)**, known as calciferol, the preferred form, although it is difficult to find. The choice between D2 and D3 comes down to preference for a plant based diet.

Vitamin E: Naturally occurring vitamin E exists in eight chemical forms (alpha-, beta-, gamma-, and delta-tocopherol and alpha-, beta-, gamma-, and delta-tocotrienol) that have varying levels of biological activity. Supplements of vitamin E typically provide only alpha-tocopherol, although “mixed” products containing other tocopherols and even tocotrienols are available. A given amount of synthetic is only half as active as the same amount of the natural form [12]. **Natural vitamin E with mixed tocopherols** is recommended.

It all comes down to dietary choices, but does it?
Medical psychologists can play an important role in discovering and correcting nutritional deficiencies that can cause or exacerbate symptoms typical of many “psychiatric” disorders. We could become proficient in these issues, or we can, as a minimum, gather information and know when to refer out to nutrition specialists.

One size does not fit all when it comes to nutritional guidance. A study in the journal Molecular Psychiatry [38] suggested a “psychobiotic diet” to improve microbial stability and perceived stress. The diet included 6–8 servings daily of fruits and vegetables high in prebiotic fibers (such as onions, leeks, cabbage, apples, bananas and oats), 5–8 servings of grains per day, and 3–4 servings of legumes per week. They were also told to include 2–3 servings of fermented foods daily (such as sauerkraut, kefir and kombucha). This diet is in line with the “food pyramid.” Here’s how even this perfect diet for perfect genes would look (see page 44):

This “ideal” diet, with a healthy female, 51 + years old, with no added stressors, provides 408 extra calories for a moderately active female, yet only provides 84% of needed calcium, 13 times the recommended iron, and only 71% of recommended folate. Do you, or anyone you know, eat this array every day?

Table 2 Sample 1 Day Psychobiotic Diet							
1 Serving	Calories	Protein	Calcium	Iron	Pot. K	Mag. Mn	Folate
Onion	32	0	9	0.1	61	4	0
Leek	61	0	9	0.1	61	4	0
Cabbage	25	1	17	0.2	91	6	16
Apple	52	0	8	0.2	148	7	4
Banana	89	1	6	0.3	422	32	24
Oatmeal	369	4	21	4	112	45	0
Cheerios	376	3	128	4.7	99	38	41
Whole wheat bread (4)	320	4	32	48	71	19	18
Sauerkraut	26	1	23	1.1	128	10	18
Kefir (unflavored)	120	6	126	0.7	250	19	23
Kombucha	50	0	0	0	0	0	0
Green beans	31	1.8	37	1	211	25	33
Additions for complete meals							
Turkey lunch meat	90	24	0	0.18	59	6	1.1
Butter (2 pats)	70	0.2	6	0	6	0	0
Almond milk (2 cups)	180	2	400	0.8	0	32	0
Baked potato	291	4.3	26	1.9	926	48	47
Totals	2608	72	842	64	2828	323	228
RDA (female 51+)	2500	53	1000	5	2600	265	320
Source: Feed your microbes to deal with stress [38], What We Eat in America [12]							

A Sample Protocol

Nutritional factors may be involved whenever a patient presents with long term issues of sadness, anxiety, ADHD, fidgeting or any of the major "mental" disorders including schizophrenia, bipolar, or dementia. Nutritional issues are especially common in patients that do not respond to psychotherapy as expected. I recommend the following approach:

1. Obtain all available lab reports and physicians notes as part of new patient intake, and request all new labs as available. Review labs and look for abnormalities. Consider taking a lab interpretation course such as through NAPPP [39].
2. Take a thorough history of illnesses and allergy symptoms.
3. Collect information on all drugs and supplements including dosages and the patient's response to them. I use Epocrates, a free drug resource, to look for drug adverse effects and run their Interaction Checker [40].
4. Inquire about diet and eating habits, including whether meals are prepared at home.
5. Do a conscientious intake, noting pallor, bruising, posture, gait, motor and sensory skills, balance and coordination, and include a mental status exam.
6. Consider all factors and request additional labs from the primary physician if appropriate to symptoms. I find the best cooperation comes when suggesting the physician "ex-

plore" a particular physical diagnosis. Notify the physician if the patient did not follow accepted protocols or had taken high doses of biotin prior to affected tests if retesting seems warranted.

7. Educate the patient to discontinue multivitamins, B complex, hair and nail supplements and other supplements containing biotin 3 days to 1 week prior to thyroid and sex hormone tests.
8. Refer to the patient to a nutritionist, neurologist or other specialist if appropriate.

I counsel my patients on selection of supplements, and inform them that exclusive brands and formulas are usually unnecessary. I recommend use of sublinguals whenever available, an important approach for those with GI disorders. Recommend a basic supplement list, including:

B-Complex: ideally with B1 as benfotiamine; B3 as niacinimide; B4 as alpha-GPC; B6 as pyridoxal 5' phosphate (PLP), B7 as natural biotin; B8 as myoinositol; B9 as 5-methyltetrahydrofolate (non-negotiable!); and B12 as methycobalamin.

Vitamin B12: If over 60, I recommend a separate sublingual B12 1000 mcg

Vitamin C: Extended release, 500-1000 mg/day

Vitamin D: D2 for vegetarians or D3 for omnivores, 5000 iu

Vitamin E: as Natural mixed tocopherols

Zinc: 50 mg EVERY THIRD DAY (can interfere with iron absorption).

I add particular nutrients to this list depending on symptoms:

Multivitamin: With particularly poor dietary patterns, I recommend a multivitamin (that does not contain folic acid as a folate source).

Glycine: With anxiety, sleeplessness, fidgeting (particularly with ADHD) I recommend free form (powdered) glycine, 1 tsp bid with buccal absorption and fish oil, 4 gm/day.

Magnesium: With sleep problems I recommend magnesium 500 mg in the evening, and or baths with epsom salts

Metatonin: For sleep issues, melatonin works wonders. It is used continuously rather than as needed as it is not a sedative and has largely replaced hypnotic use in many nursing homes, Sublingual melatonin 5 mg 1 hour before bedtime.

Potassium: I suspect subclinical potassium deficiency with anxiety, sleep problems, muscle cramps and "restless leg syndrome." Errors in potassium measurement are fairly common [41]. Be cautious with patients taking potassium sparing diuretics and educate them about signs of hyperkalemia.

I provide interested patients with a copy of Table 3 Nutrient Deficiencies Associated With Mental Symptoms (below) and recommend specific additional supplements based on laboratory findings and symptoms. Journal references for use of each of these nutrients may be found in Nutrition and Genetics in Medical Psychology Practice, in the NAPPP book

Table 3 Nutrient Deficiencies Associated With Mental Symptoms						
	Anxiety	Depr.	Schiz.	Bipolar	ADHD	Cognition
Vitamins						
Vit. A		x	x		x	
Vit. B1	x	x	x		x	x
Vit. B2		x		x	x	x
Vit. B3		x	x			x
Vit. B5		x				x
Vit. B6		x	x		x	x
Vit. B7						x
Vit. B8			x		x	x
Vit. B9		x	x		x	x
Vit. B12		x			x	x
Vit. C	x		x			x
Vit. D	x				x	x
Amino acids						
Alanine	x		x			x
Arginine	x	x				
Cysteine	x	x	x	x		x
Glutamine		x				x
Glycine	x		x		x	x
Histidine	x					x
Isoleucine	x	x				
Leucine	x	x		x		x
Lysine	x					x
Methionine		x	x	x		
Serine	x	x	x			x
Threonine			x			
Tryptophan	x	x	x	x	x	
Tyrosine			x			x
Carnitine		x				x
Choline	x	x	x	x		x
Citrulline		x				
Glutathione	x	x				
Taurine	x					
Minerals						
Lithium			x	x	x	x
Magnesium	x		x	x	x	
Potassium		x				x
Selenium		x				x
Zinc		x	x		x	x
Fatty Acids						
Omega 3s			x		x	
For research references see Nutrition and Genetics in Medical Psychology Practice [40]						

Crisis in Psychopharmacology [41]. The nutrients listed are safe with normal dosing, but I recommend against mega-dosing.

Where do we go from here?

It is clear that nutrition plays a major role in all aspects of health. We are very early in the study of genetic nutrition, and the volume of information we already have uncovered demands full time study. Just as with the growth of information in other branches of healthcare, computers and the data crunching ability of artificial intelligence promise to dominate healthcare in the near future; many believe it is already time to retire the old model of physician training, to be replaced by technologically savvy symptom documenters and testing technicians. The "traditional" annual physical, with lab results available only AFTER seeing your doctor, is well past its expiration date.

Although the role of traditional physicians, including psychiatrists, is rightfully shrinking with evolving science, there will always be a need for psychologists, counselors, pastors and coaches to guide us through life challenges and to help us deal with the unexpected, the misguided thoughts and the pressures of life. It may be that medical psychologists will be the first contact for all health issues; we now are the most highly trained at identifying the nuances of health issues and may be the best profession to orchestrate the team of symptom collectors, surgeons (yes, they will be safe!), medical technicians, nurses, and the compounding pharmacists that will make personalized medicine a reality.

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The Challenge of Medical Psychology in a Divided Society Dominated by Delusional Thinking

Jerry Morris and John Caccavale

Abstract

Understanding the linkage between social and environmental events in the mental health of a population requires a look into the political and social stability of leadership and its followers. Unfortunately, many times, the content boundaries of specialization inhibit and interfere with practitioners being able to recognize and treat patient's concerns from living in an unstable society racked by political and religious dysfunction. In particular, an analysis of the present instability in American society is viewed through the works of Plato, Freud, and Allport. Their perspectives are reviewed as frameworks for understanding and providing the rationale for expanding therapeutic content boundaries. The continued divisiveness and political psychopathology now occurring in American society is presenting significant challenges to medical psychology and medical psychologists.

Introduction

Clearly these are difficult and stressful times for American society. For medical psychologists and our specialty, changes that take place on the meta levels of politics, law, and technology does have its effects on what we do and how we provide our services. Clearly, there are always social forces that produce stress related to upheaval and division. It's the human way. Social forces and counterforces often collide producing periods of unease and struggle. Within these struggles also comes problems that lead to a range of psychological issues including stress, suicidality, and a wide array of clinical presentations seen by mental health professionals including medical psychologists. Most societies ultimately weather upheaval and find a way to accommodate those for change and those against. History shows that those societies that continue a path of divisiveness and struggle lose all benefits that living in a society can bring. It appears that here, in America, we may be now be at the point where the manifest functions of living cohesively and cooperatively get lost in the squabbles of latent functions. These types of societal events can have a dramatic effect on the mental health of a population.

Typically, patients seeking the services of mental health professionals focus on a myriad of issues that are more personal to them. Anxiety about the loss of personal freedom and other politically oriented concerns, rarely receive therapeutic attention from providers. Medical and mental health practitioners are unlikely to diagnose a mental or behavioral disorder based upon political beliefs that border on hallucination and the like. Probably, a patient that might present with complaints, for example, that the 2020 election was stolen, or that John F. Kennedy, Jr. is alive and seeking to restore Donald Trump to the presidency, are likely to be redirected by the practitioner to issues more personal in the patient's life. Few practitioners are willing to engage such patients with what they believe is "political" talk. Many practitioners may have forgotten that our model of behavior is the biopsychosocial model with "social" being just as important as the other two. For some, or perhaps even many, these issues are not perceived as psychological. As a result, many social issues that are directly affecting the mental health of many patients may never receive the attention they deserve. The question is, why not?

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All specialties work within a framework that essentially carves out the boundaries of their domain. The content within those domains is both limited and limiting. Generally, practitioners tend to narrow down the focus of treatment to familiar territory and issues that appear more prominent in the patient's presentation. All of this is understandable but the boundaries that we put on ourselves as professionals, may need to be reexamined in the face of increasing psychological stress resulting from social and environmental events that affect an individual, perhaps not directly, but by simply living in a society. For medical psychologists, expanding our boundaries may appear daunting to some but medical psychology has already expanded the boundaries of psychological practice and there is no reason why we cannot develop a framework to address the mental health issues of patients whose issues are related to their concerns for their wellbeing and related to their assessment of current events outside of themselves, such as anxiety about the potential loss of democratic freedoms or autocratic leadership. Anxiety and depression, for example, can be a direct cause of almost anything occurring within the environment. Likewise, hallucinations and aggressive behaviors related to one's political ideology can be an important focus of diagnosis and treatment. The end all of diagnosis should not all be within the pages of the DSM. Moreover, there already exists frameworks in psychology that assess and provide treatment outside the traditional boundaries of what normally is considered content for psychological treatment.

For example, Feminist therapy, at its inception, included the recognition of the importance of environmental pressures, particularly gender roles, gender-based discrimination, the assessment of power relations, relationship abuse and their effects on the mental health of female patients[1]. To not belabor the point, however, a person who suffers from anxiety or depression because they are concerned that political events are threatening and are fearful for their future is a legitimate focus of therapy apart from any other issue. Likewise, a person who believes that children are being abused, eaten, and held in back of a pizza store by Democrats is a legitimate focus of diagnosis and treatment. Political hallucinations of fake conspiracies and fear are routinely seen in patients suffering from schizophrenia, schizoaffective disorders, schizophreniform disorder, bipolar disorder, and severe and psychotic forms of major depressive disorders. Further, the pervasive distribution of misinformation and the resulting chaos of the past several years has negatively affected many people whose issues and concerns are not addressed because many practitioners mistakenly believe that these are "political" issues and outside the boundary of therapy. Clearly, these types of issues are challenging to address but medical psychologists are in the perfect position to expand our boundaries to accommodate these issues in the same way that feminist therapists have shown no fear in attacking patriarchy as a direct source of a patient's mental health. Or, how African American psychologists understand the negative effects of racism on the mental health of African-American patients, which is just as applicable for people of other ethnicities and races suffering discrimination.

We are reminded by history that entire groups and even societies can become mentally dysfunctional, disturbed, even psychotic[2]. This includes religious groups with fantastic delusions and breaks. Extremist religious groups use emotional appeals that prey upon disaffection, persecutory ideas, and paranoia as a vacation from reality. When coupled with charismatic, but psychotic leadership, we have seen mass suicides and murder. Extremist religious ideas have driven fantastic delusions justifying holy wars and mass killings of their neighbors to justify the "protection" of their ethnic or philosophical group. In a similar emotional and delusional rationalization, nations can view other humans as inferior and enslave, torture, or kill them[3]. Cultures can invest in comforting delusions that drive them to maim the genitals of girls, to put huge wooden hoops through their lips, and burn envisioned witches or cripple the feet of female babies. Paranoid delusions and fears of

ethnic or other groups have resulted in gas chamber genocide and cast systems while declaring other humans as "untouchables." Fearful immigration policies that make no realistic, workforce, or economic sense are used by some cultures to cast out the needy and vanquished. Human beings have a propensity to drive paranoid, persecutory, grandiose, and hostile delusions into extreme psychopathology and breaks with reality. They can engage in irrational and cruel acting out, sad and embarrassing regressive thinking and acting. The history of homo sapiens is not always rational, healthy, and a positive constructed sense of reality. Folie du is a well-documented phenomenon, as is large group madness. People individually, in groups, and in a cultural or national group have demonstrated the human inclination to do engage in horrible acts of violence. Therefore, Medical Psychology, as a specialty, would be loath to ignore our responsibility, expertise, and ability to identify group members of specific groups that are delusional, massive distorters of reality, and who are interpersonally, socially and emotionally dysfunctional.

For many years, the Diagnostic & Statistical Manual (DSM) held that religious hallucinations were an indication of a serious mental illness. That has since changed and no longer considered abnormal. The same can be said of sexual orientation and like issues that no longer are considered an indication of a mental disorder. These changes are correct and appropriate. However, the same cannot be said of people, who as a group, engage in chaos and violence based upon myths and hallucinations disguised as political ideology. For sure, some psychologists and others may believe that these issues are the domain of political science, sociology, and law, and an argument can be made to support some of these behaviors. However, psychopathology cannot be dismissed or brushed aside because the behavior of people who act on dangerous political myths and hallucinations is the appropriate domain of psychology and medical psychologists. It can be argued that, as a relatively nascent specialty, we are in the best position to expand our foundational boundary to include subjects that other professions might do well as observers but have no capacity to diagnose and treat. Clearly, not every person who believes the 2020 election was stolen is suffering from a mental disorder. Not every person who supports Donald Trump and autocratic regimes is psychotic. But this is not the issue. The issue is for medical psychologists to look at how myths and hallucinations that become dominant in society are and should be the focus of diagnosis and treatment. Likewise, patients experiencing stress from concerns relating to political events also deserve recognition outside the typical diagnostic categories we so rely upon. To this end, looking back into psychology's roots in philosophy and the earlier works of psychology's founders can assist medical psychology in dealing with these complex issues.

Freud and Plato: Political Leadership and The Relationship To Mental Health

Plato is both interesting and perhaps important to modern psychology and practice. Humans do not exist in a vacuum. Homo sapiens are social beings and to understand what contributes to sound mental health, we must ask a very basic question: what constitutes the good state and how do the actions of the state affect individual health? People rely upon their social settings and group. Above the group is the notion of society and the state. Above all that is civilization. In essence, we live in a hierarchical system and at each stage of that hierarchy there are opportunities to promote a good society and subsequently the good person. Therefore, to understand the psychological system embedded in Plato's psychology is the notion that the human psyche is the seat of all knowledge and that the human mind is imprinted with all of the knowledge it ever needs. Like Socrates, humans have the capacity to know what is right and what is wrong. It's a transcendental process where knowing what is wrong is known to the individual even in the absence of anyone seeing a wrong act. As psychologists, we are keenly aware of this process and we may call it guilt, shame, or embarrassment. Thus, everything that occurs within our social hierarchy

has an impact on human behavior. The state is the highest level of hierarchy and politics is the means by which the state corrals human behavior. People's beliefs in the state can affect their mental health for the good or the bad.

Plato discussed a concept called the "noble lie," which he described as a myth that justifies the fundamental arrangement of society[4]. Plato believed that if people didn't believe the lie, then society would fall into chaos. Noble lies create and sustain social cohesiveness. High levels of social cohesiveness contribute to an individual's positive mental health. American society is replete with many "noble" lies. American exceptionalism, the myth that American society is number one in everything. Or, America has the world's best healthcare system. Another myth is the belief that everyone is equal under the law. Actually, there are so many noble lies that to list them would be outside the focus of this article. The issue is not the number of noble lies since every society engages in them and needs them to form social cohesiveness and a sense of wellbeing. The important issue is when noble lies are no longer believed and the resulting discontent and the subsequent effects on the individual's mental health. This is what makes these issues the rightful domain of medical psychology.

In the late 1920s Freud published one of his most important works in his "The Future of an Illusion and Civilization and its Discontents"[5]. This would dominate his thinking and future work for the rest of his life. As he turned from endopsychic dynamics and their modification and internal instinct and drive theory to psychosocial manifestations of human nature, like Plato in "The Republic,"[6] he found some of his greatest thinking and contributions to those open and willing to understand complexity. Freud believed that civilization had powerful dynamics that could activate good or evil. Much like Plato and the concept of the moral and despotic leader continuum, leaders could do good or evil depending on how they resolved the ambivalent urges and torn nature. The conundrum is the struggle between satisfying our instincts and more animal desires and needs and the cultural benefits of group collaboration. For Freud, effective power is given to leaders to balance animal and social interests, to enforce and regulate cultural norms, to provide historical and culturally relevant and supported solutions, and further group aspirations.

Freud believed that there would be no developed civilized compulsion to work, unity in group projects, and to deprive oneself from short-term lust or hedonism without civilization. To Freud, civilization and evolved culture provides the external motivation and energy to resolve the natural conflict between our animal hedonic selfishness and violent nature. Civilization helped to strengthen internal higher cortical supervision and the channeling of expression and satisfaction of our animal frame and lower brain. Dysfunctional civilization produces chaos and effects mental health. These notions are consistent with Plato's ideas, but he also emphasized moral development and internal bastions against the lusty and selfish beast in man. For philosophers such as Plato, moral development was synonymous with mental health. Still, both men warned that a natural competition between these two forces would result in feeling of deprivation, incursion on freedom and natural selfishness, and in many, the need for civilized living, productivity, and in the ability to take pride in cultural ideals and accomplishments. This perpetual internal dialectic and possible amenable balance and channeling is a constant tension in humans that can trigger dreams and nightmares, impulsive sexual deviance and fetishes, distracting and symbolic compulsions, addictions, and even psychotic breaks, which can leave the reality field in retreat. Freud indicated that a natural and inevitable frustration between the inhibitions of civilization and gratification might lead to weak leaders who feared being deposed and that are dominated by animal affects and drives including fear, paranoia, anger, jealousy and lusts, greed, grandiosity, and hunger for power.

As placators of the animal frustration and resentment of the necessary restrictions imposed by civilization, Freud thought that weak leaders might sell out to keep personal power and position. Thus, a devolution into a hostile, regressive, and more incestuous, philosophically cannibalistic, and lust for killing, which Freud saw as core human instincts. Like Freud, Plato believed that many would sell out honor, a foundation of civilization and effective leadership, for greed and wealth and would try to move civilization toward Oligarchy. Thus, Freud and Plato saw the struggle between man's animal lust and aggressive impulses and the establishment of a more other directed political and economic system that balances these impulses and inclinations as essential but tenacious. From about 375 BC to the early 1900s, the two saw similar dynamics and risks to the control and refinement of human nature and preservation of society. The importance of all of this is that social discontents and the loss of trust in leadership and societal institutions will have negative effects on an individual's mental health. It is well accepted that violence is difficult to predict in an individual, aside when there is a history of violence, however, what we do know is that frustration can lead to aggressive behaviors. The Frustration-Aggression Hypothesis is a foundational principle in psychology[7,8,9] and is very consistent with the works of both Freud and Plato. Moreover, the relationship between those who lead and legislate have their effects on behavior and is an important part of psychological treatment and well within the domain of medical psychology.

Freud, and Plato earlier, described this devolution of society and civilization by under-developed despotic leadership. They believed that civilization didn't have to worry about the despotic leader from "the educated and brain workers," who he saw as "vehicles of civilization" and largely resolving a rational balance between "religion as a protective illusion and defense against childhood and human historical helplessness (against nature)." Accordingly, the danger would come from the great mass of the "uneducated and oppressed," who are systemically disadvantaged, damaged repeatedly by deprivation of satisfying lusts, and who can become the "natural" enemies of civilization. Plato, on the other hand, was concerned about the development of greedy and anti-society and dishonorable oligarchs and despotic leaders who collaborate with these "enemies of civilization." Freud saw society and religion as a potentially helpful balancing force between the good of the many and the curtailment of the destructive and over expressed animal instincts. Plato, and his protagonists, Socrates, Glaucon, Thrasymachus, Polemarchus, and Adeimantus believed that enlightened people had the capacity to discern reality from delusional representations. People also have the propensity to avoid "The Good" and "The Bad" and to see reality through rational thought. Of course, they also believed that society needs the leadership of philosophers with the discipline to see through the delusions and partial and distorted knowledge that many in society are inclined to develop.

Plato developed the Theory of Universals and the insights and allegories and the Theory of Forms to help us envision the world of appearance and its' distinction from the real world of Forms. In the allegory of The Cave, he posits the universal that people seem to find and characteristically project on to many objects and phenomena that have similar components and then miss the reality of the composite differences (reality). Thus, in the allegory of The Cave, Plato makes a distinction between the tendency to extrapolate from appearances and the need to organize them with the familiar. In The Cave, prisoners are imprisoned by their lack of experience of reality. Plato's point in this allegory and the Theory of Universals is that the thinking person or philosopher struggles past being trapped and imprisoned by over generalization and limited experience and seeks reality. The notion is that the thinking person struggles to find reality against ignorance and inexperience, seeking comfort in a more universal Form or accepted reality, and struggles to find and see more and differentiate between appearance to shine light on reality. Plato talks about levels on a

divided line. He recognized that many haven't developed the capacity to struggle to find reality. The line is divided into what is represented in the visual world and what the actual or intelligible world represents.

In Plato's allegory, the visible world receives no light. When one moves outside the intellectual prison and the distorted and limited experience of the prison in the cave, light and reality is available and tolerated, if only for a limited time. Only by intellectually seeking reality and avoiding the trap of universality and the habitual thinking through the level of common Forms, do people become capable of appreciating reality and find the higher order form Plato called, "The Good." This opens the ability to stay and explore the boundaries of reality. Finally, Plato concludes that once enlightenment is attained, the Philosopher's Burden is to reenter the cave and educate those in the material world. Plato warns that only leaders who can comprehend reality and refuse to be prisoners of universalities and habitual forms, rather than reality seeking forms, are fit to lead a country and society. Interestingly, leadership in this context can apply to many different types of leaders. Political leadership is only one type that Plato contemplated. Medical psychologists, as do other mental health professionals, see our task as leading patients out of the limitations of that seen in the cave to the light of reality through personal insight. Although the less applicable concepts and relevancy in some of Freud's and Plato's works may seem too outside of what we do as psychologists, it may very well be that, we too, are looking at the shadows of the cave thereby missing much of the reality around us. Our treatment rooms provide a too safe cocoon that can block out the very rational and content of our own work.

Plato: A Cognitive-Behavioral Theorist

Plato posited that there is a level of human perception that is inherently susceptible to distortion, prejudice, delusions, impulsivity and emotionally favored thoughts and perceptions of reality. As such, many humans aren't inclined to seek light or to intellectually go further than acceptance of easy conceptualization, beliefs, or familiar and supported attitude/thought. They grow to prefer the easy, comforting, group supported, apparent Form to struggling and providing the intellectual rigor and openness to information and enlightening experience to refine their grasp of reality. The philosopher's dedication and tolerance of complexity is not attractive to them. Plato accepted that but clearly thought society must avoid putting these below the line individuals in leadership positions because they will distort and be guided by delusions and will not have acquired the wherewithal to move to an appreciation of the Form of The Good. They will lack insight and effectively become despots locked in the lower Form of Thinking and self-aggrandizement. He pointed out that without qualified and reality-oriented leaders, a society can degenerate into a timocracy (a form of government in which rulers are motivated by ambition or love of honor), oligarchy, or demagoguery. As a side note, the psychologist, Gordon Allport, defined prejudice as feeling favorable or unfavorable toward a person or thing, prior to, or not based on, actual experience[10]. Like Plato and Freud, he recognized that emotional thinking, or being guided by the lower or animal cortical regions, results in immediate resolution through instinctual and lustful drives, but often at the expense of a rational and realistic perception and appreciation of reality and long-term search for The Good Form in thinking and adaptation. Allport mirrored Plato and Freud's concept that man's struggle to balance the animal/lower brain, and social interest/cortical brain.

He favored thinking that allows for realistic appraisal of each other and the world and reality. He recognized however, man's desire for and seeking of reality can become interrupted by unfounded, pigeonholed, distortions of thoughts and /beliefs, and delusional misrepresentations of reality in service of knee jerk primitive and instinctual need for quick

resolution of feelings. Allport saw prejudice or emotion-based thought as a natural and normal process for humans because, like Plato, he believed that human beings think with categories or Forms as in Platonic writings. He believed that once a category is formed and applied, reality testing stops, prejudgment or distortions are engaged, providing a temporary order on things. This partial or distortion of reality can become reinforcing and even addictive making prejudice difficult to overcome. He recognized that distortive and unrealistic thinking serves many primitive human needs. Still, Plato was obviously correct that you don't want habituated distortive thinkers and their alternate reality to lead society. Here, Allport, psychology, medicine, and philosophy came together over the span dating from 375 BC to the 1960s.

Current Events in American Society And The Relationship To Practice

The works of Freud, Plato and Allport give a particularly insightful perspective of current events in American society and professional psychology. In Freud's and Plato's conceptualizations there is a positive and progressive pull to work, collaborate, allow a civilization to set helpful inhibitory codes of behavior and conduct, and to enforce a certain amount of privation and balance between the animal and civilized aspects of man. An effective culture will elevate realistic, clear thinking, and humanistic leaders that will help a society keep an accurate vision of reality, a balance between humanism and group orientation and personal hedonistic drives. On the individual level, social stress resulting from ineffective leadership and the dissolution of important Nobel Lies, significantly contributes to psychopathology and the need to expand therapeutic boundaries to accommodate less traditional content in therapy. Psychological science teaches that when stress, substance abuse, over prescription of medications, societal division, and psychopathology are elevated, increased delusional and inaccurate and emotion-based thinking and choices increase.

From this perspective, the misinformed notion of the childlike elevation of individuality, absolute freedom, and the extremes of individual choice and demands is a move toward the devolution of society and civilization. Still, Freud and Plato believed that there is a constant war in each human and in leaders and the culture to either devolve or evolve. Presently, current events in American are in a period of division and struggle between the irrational and civilized society. In fact, there is research that shows that even rare delusional thinking is prevalent at almost nine percent of people who show certain paranoid traits and in certain more insecure and paranoid cultures and societies[11]. Some studies show as much as a ten percent incidence of grandiose delusions in the normal population[12].

Freud ably and thoroughly explored one of the bastions of most civilizations and one of the great inhibitors of our animal and selfish and aggressive/violent nature. He thought much of religion, for example, could be positive and a support to privation and civilization. In this conceptualization, religion reinforces the mass acceptance of leadership and their powers, as referenced in Plato's, *The Republic*. Healthy leaders are magnanimous, courageous, and public oriented. To Freud, as long as religion, what he described as its helpful illusions, are operative and foster positive feelings and aid the overwhelmed and the poorly defended psyche, religious beliefs are constructive. Religious tenets may create group enforced and trained values that maintain the identity of being saved. However, if this balance is disrupted by weak and placatory or pandering leaders who raise their lust to higher levels thereby undermining privation and pride, any adherence to the value of being in a civilization and society will become more dominated by narcissistic satisfaction, lust, aggressive urges, hostility, and the cannibalization of cultural institutions. The effects on the mental health of individuals have a direct link to the leadership of a country. Moreover, psychopathological leadership in a region will also affect the mental health of individuals. Religion itself could

be mutated from Freud's Positive Illusion to become a conceptualization favoring extremist individuality and individual freedom. In America's latest social and political iteration, the belief in extremist individuality and a misplaced notion of what constitutes individual freedom has led to violence, aggression, extreme misinformation, divisiveness, and political instability. Collateral damage this social and political upheaval is the mental health of many of the citizenry reflected in increasing demand for mental health services.

Along with this social and political unrest, the misuse of religion has been unleashed to claim the right to act in anyway one pleases as long as it can be rationalized as an act of absolutist religious extreme freedom. Such a devolution removes the positive individual and civilization dynamics embodied in religion. Christian Nationalism, for example, devolves into a political ideology removed from the true nature of Christianity and religion, as a whole. These dynamics cannot support what Freud envisioned when he talks about religion and its positive effects on people. When Plato's "Nobel Lies" associated with religion fail, believers become vulnerable and disoriented. In this perspective, for Plato, the extremist delusional religion would no longer achieve The Good or the moral leader and defender of the soul – the essence of the human being. In Allport's view, we can imagine his conceptualizing this extremist religion as a regressive and negative coping prejudice adaptation. Despotic and authoritarian leaders could take advantage for extremist concepts of faithful entitlement, revolutionary freedom and rights, and contempt for worldly Governments in favor of a grandiose delusion of serving the other world kingdom in an anointed holy war. We have seen in Freud, Plato, and in Allport, the manifestation of delusional religion playing out repeatedly over the centuries. And, while none of this is unsurprising, the coping mechanisms of today's population differ significantly from those of our ancestors. The way modern humans in highly specialized societies, such as America, handle social stress leave open the vulnerabilities that significantly impact mental health.

As predicted by these seminal figures, a frustrated, hostile, and socially and culturally cannibalistic faction of followers, who are susceptible to paranoid and delusional leaders and ideology, can develop an anti-civilization and counterculture that affects all. Historically, this has happened in several renown countries and cultures. People who become trapped in this milieu can question their very existence. An alternate reality can develop, in Plato's terminology, where people react to shadows and imagined entities on the cave wall that are moving and becomes ominous as the sun moves through the conceptual cave opening of the mind. This becomes not only the content for therapy but the reason that therapy is sought out. This is why philosophical content can be another tool to understand many of the unacknowledged material that can matter in therapy. People who are damaged by social and political abnormality but find comfort in the misplaced notions of extremist individuality and freedom have a tendency towards supporting violence, aggression and power. In an alternate reality, paranoid delusions lead to conspiracy theories and strategies and resources amassed to address imaginary threats and conspiracies. Like a shadow boxer hitting at the shadow, the actual reality and realistic adaptive functions become subservient to the delusion or attached prejudices and anxieties. Lying for personal gain, opposed by all civilizations, becomes acceptable in the "end justifies the means" anti-civilization dynamic. Grandiose delusions energize ideas of special privilege, overarching the mission, and higher order callings and privilege that give permission to act outside the culture and norms.

Per Plato, Freud and Allport, because some are so disposed by the large influence of the uneducated, lusty, frustrated, dishonest, aggressive or violent, they often resent all the constraints and sacrifices that civilization asks of them. They begin to feel more persecuted, wronged, deprived, and abused. This spiraling into the alternate and paranoid reality further

energizes zealous "we-they" thinking and prejudicial casting of all others as the enemy creating excessive demand for supporters to be completely cohesive to chase intense fears. From their devolved immaturity, and psychological instability their proclivity is to rage against mainstream agencies and departments of government, mainstream religion, science and public education, which are the glues that often defend and hold Civilization together. In social cannibalistic fashion, as predicted during moments of angry regressions to oral aggressive states as written by Freud, fearful exclusion and rejection per Allport, and support of despots and oligarchs who claim they will save them as predicted by Plato, psychopathological leadership and their followers are simply not healthy for the country or those living in reality.

Medical Psychology in a Psychologically Disordered Civilization

A civilization that is undergoing social stress and division comprising a significant number of prejudiced or fully delusional or paranoid members, is in great psychological, social, and institutional danger. They, like with most mental health issues, are vulnerable and susceptible to chronic stress and stressing others. Faulty decision making and coping decisions that create and compound stress, can trigger illnesses such as addiction, violence, obesity, lowered immune function, negative lifestyle and family patterns, and crime. Healthcare systems become burdened with issues related to shortened longevity, sleep disorders, gastrointestinal disorders, and increased multigenerational projections of mental illness. In the paranoid, damaged, insecure and unhappy state, they undermine and cannibalize their own institutions. A society at this stage is susceptible to increased anger, propensity for aggression, wars, civil unrest, and political violence and cruelty. Disturbed and self-infantilizing societies lose the trust and collaboration with their allies and business partners. Soon, anyone who is outside the group or tribe, is to be feared and irradicated, if possible. The slightest annoyance or deviation from the expected delusional and prejudicial vision is seen as hostile and a danger. Presently, American society is experiencing the stresses resulting from a dysfunctional Republican Party and the psychopathological leadership of Donald J. Trump. And, while many try to understand how "we got here," understanding Plato, Freud, and Allport is a starting point.

Those who are increasingly reinforced in the group's shared delusions, see others a being "unpatriotic" and outside the spiritual calling to arms. They resent the advantages of the educated and their role in maintaining civilization. Jealousies, fears, vulnerabilities, denied and suppressed but nonetheless subject to painful shame and guilt, can be easily turned to accept the destruction of institutions and the elimination or control of individuals that resist. Unfortunately, we have seen this play out too many times in American society as many arm themselves to the teeth, storm the citadels of government with malicious intent bordering on the murderous. They physically and emotionally abuse leaders who stand against free reign of the autocratic lifestyle. They are freed by weak, intimidated, and pandering and propagandizing leaders who have contempt for the educated as a way to rationalize aggression, hostility, purported persecutions, while blaming others for a past previously enjoyed. They become more than immature and ignorant of the value of Civilization that Freud pointed out, and project blame to all but themselves. The problems they envision are damaging to society and individual mental health.

Plato in 375 BC saw these things coming and discussed moral leadership and civilized psychology, as did Freud at the turn of the 20th century. American society is at the turning point where greed and power-hungry individuals that will pander to the most base human emotions, such as fear and loss. As much as one fourth to one third of our society is now committed to and has rationalized their right to devolve and set anti-civilization goals,teachings, and subculture supports and counter-culture institutions[13]. We have seen

Americans, who believe they are being patriotic strong arm their way into the halls of government seeking to burn it down and disrupt their function. Freud predicted oral aggression and a regressed developmental level is transparent in slogans like “Deconstruct the Government,” “Stop the Steal,” and “Stop the Deep State.” When reaching this level of psychopathology in a society, a tipping point is approaching and governmental institutions need to be reinforced. For medical psychologists, it is likely that more stress related physical disease, co-morbid mental illness, and co-morbid addiction and stress and family disease will be the focus of treatment[14].

Concluding Remarks and The Challenges to Medical Psychology Practice

Medical psychologists must be prepared to deal with clinical presentations related to the lost beliefs of American exceptionalism and the self-esteem buoying it has provided. The loss of many Nobel Lies will bring challenges as the content of therapy will not be the familiar reasons people seek treatment. The list of events that psychologists use to diagnose social anxieties will need to be expanded. Pride, social cohesion, civility, trust of each other and the future, and sense of security will give way to chronic anxiety and resentment. Medical psychologists will not be able to fall back on traditional practice strategies because loss of self-esteem emanating from social division and strife that heretofore was seen as triage, will now become a large part of practice[15,16]. Medical psychologists with the broadest training, scientific background, integrated healthcare techniques, and diagnostic training in psychology and some hold in healthcare disciplines, in general, are going to be in demand in the next several years.

One reason for the increase in demand is that, at some point, society will have to face the reality that many people who have been tolerated as engaging in constitutionally guaranteed political behavior are, in fact, in need of treatment. Moreover, the collateral damage to others resulting from the mal behavior of psychologically damaged actors, will increase the need for medical psychology interventions. Medical Psychologists will be essential in treating the harmful effects of these challenges. However, only consistently rational, humanistic, reality oriented, and enlightened practitioners will be able to address and decrease the incidence and prevalence of the one quarter to one third of society that will suffer with these debilitating disorders. A society can’t prevail if the tipping point where false reality, misinformation, and delusion are beyond containment.

Clearly, many of the statements in this article can be seen by some, or perhaps even many, as baseless and ideological. To the claim of some or many of our concerns are baseless, we are reminded that Freud dismissed what was occurring in Germany but then had to literally run for his life in the middle of the night to safety in England. We recall the plight of Viktor Frankl, the Austria psychiatrist who resisted the German autocrats but was not as fortunate as Freud, and spent many years in a concentration camp before being freed. We also remember that Adolf Hitler was democratically elected in Germany. Autocratic leaders and governments use the same playbook to gain and maintain power. They promote and use fear as their strategy to control and create chaos. They allow and use the mentally damaged psychopaths as their enforcers. They break down the important social norms and turn citizen against citizen. Unfortunately, as these autocratic governments and leaders gain power, mental health and mental health practitioners either become pawns for the corrupted state or they become the enemy of the state if they resist the lies and delusions. The two authors of this article have extensively traveled both domestically and internationally. We have heard from those subjected to political trauma and seen the long lasting, damaging effects of autocracy and the delusional leadership in countries such as Chile, Venezuela, and Argentina. Until this day, decades after ridding their societies of pathological leaders and followers, we have seen the lasting effects on the mental health of many in those countries.

To those who might think that this is nothing more than political ideology, we suggest that psychologists have become more than mental health providers. We stand up and advocate for those who are too vulnerable to advocate for themselves. We help provide insight into fears and a sense of reality for those trying to understand their plight. Political behavior that promotes damage to people are the absolute domain of psychology and, in particular, medical psychology. Any event that impacts the mental health of people are our concern no matter what our political affiliations or ideology.

We have the responsibility to speak out and point out any negative influences in society that affects our patients and future patients. Moreover, psychologists are really "canaries in the mine" as we spend an inordinate amount of time listening to people and their fears. Who better than us to ring the bell of concern? Who better than us to see the psychopathology of corrupt leadership? We are psychologists and we became psychologists for a reason. We protect people from the damage that society can inflict upon them. We are the connection between the bio, psycho, and social. Lastly, psychology is a profession that embraces truth and ideas. We look towards social and personal histories to aid our understanding of a patient's condition. Therefore, it is no different for us to look at histories that promote damage and destruction.

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Exaggerated Marketing, Unethical and Unscientific Practice, and the Limitations of Psychopharmacotherapy and Pooping Out in Medical Practice

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It has become clear through my writings and those of other psychologists, physicians, and research scientists reviews that the medical and psychopharmacological groups and practitioners that many medications prescribed to patients for years have a limited effective life or "pooping out" dynamic. While the research has become clear that there are no psychopharmaceutical prescriptions have ever cured, addressed the majority of the problems and symptoms contained in a mental disorder, or that are scientifically indicated and recommended as a "stand alone" treatment approach, the pharmaceutical industry and drug convenience for prescribers has caused a near national hoax and marketing these techniques as adequate treatment for people suffering mental disorders. For the last 20 years clear science and professional standards have held that "medication only" approaches to the treatment of mental disorders is a partial or even inadequate treatment. Still, for the convenience, and profit, of the medical establishment, and the massive expenditures of "implicit treatment efficacy/adequacy on the part of the pharmaceutical industry," physicians continue these inadequate and partial treatment techniques[1 2,3,4,5, 6,7,8,9,10]. Our clinical experience is that most USA psychiatrists and primary care providers do not follow the World Health Association, Agency for Health Quality Research, Food and Drug Administration, American Psychological Association, National Alliance of Professional Psychology Providers, and the Academy of Medical Psychology science-based policies that "medication-only approaches are not the standard for adequate treatment of mental illness and that while there is evidence that psychopharmacology techniques can be a very helpful part of a comprehensive mental health treatment plan in the acute stage, there is scant evidence that they modify the long term course of a mental disorder"[10].

Thus, we have known that medical personnel prescribing medication only techniques for mental disorders are either poorly trained, unscientific, self-serving, having ethics struggles, or all the above! While the data for less-than-marginal long-term effects of psychopharmacological techniques in the treatment of mental disorders and all the scientific and relevant professional bodies recommend against medication-only approaches, another major factor in installing specialty psychological care and adequate doctorate level evaluation is the tendency for the body to adapt to any food or drug and diminish the positive effects and amplify any side effects. "Pooping out" is a descriptive phrase for the fact that the body is continuously adaptive and once many classes of medication are introduced to our physiology the physical system is throwing gene switches, largely in the cell nucleus, and adapting receptor volume and type and neuronal function to render the cells capable of handling the new drug, and thus changing effective dose, dose effect, and receptor binding capacities. Pooping out exposes the medical and pharmacological groups lack of practicing with scientifically informed methods (leaving obviously pooped out medications on prescribed schedules for patients for years or rotating other named drugs in the same class under the unfounded theory, and frankly marketing ploy, that "the new prescription will overcome the pooping out").

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The pooping out phenomenon is well chronicled in the research for anti-depressant medications, ADHD medications, cognitive decline enhancers, Alzheimer's medications, antibiotics, diet pills, and others. In the cognitive decline enhancers, the language used is:

> "These medications are prescribed to treat symptoms related to memory and thinking. While these drugs cannot stop the damage of Alzheimer's causes to brain cells, they may help lessen or stabilize symptoms for a limited time by affecting certain chemicals involved in carrying messages between the brain's nerve cells. The drugs currently approved to treat cognitive symptoms are cholinesterase inhibitors and glutamate regulators." (https://www.alz.org/help-support/i-have-alz/treatments-research)

Note that the phrase, "they may help lessen or stabilize symptoms for a limited time"! The science is clear. They don't really work as a realistic strategy[11,12].

In the antidepressants there is much work on the well-known tachyphylaxis or the antidepressant "tolerance phenomenon" or "antidepressant poop-out"! We have known, scientifically, about this medication tolerance buildup in the antidepressants since the 1980s (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4008298/#:~:text=ADT%20tachyphylaxis%20(also%20known%20as,is%20a%20form%20of%20relapse)[13]. The National Institute of Health reviews the literature and notes that in short studies, over 1/3 of patients given some antidepressants showed initial effect and then the medication effect soon pooped out sometimes in studies as short as three months or so, this tolerance syndrome was recognized. Interestingly, further studies indicated that once an antidepressant became tolerated or pooped out, switching other antidepressants under the theory that the alternative medicine wouldn't be tolerated for a while was disproven. Clearly, antidepressants were meticulously labeled a medication that treats the types of Depressive Disorder (and there are many) to market them as "an insinuated stand-alone treatment." These drugs were federally approved based on simple and low concept or face validity small questionnaires that sampled whether some of a minority of symptoms and behavior of one of the Depressive Disorders and when a small three or so point difference in 20 or 30 responses became significant statistically it was postulated that a Depressive Disorder was in what was called "remission," There are several problems with this approach. First, there was no control for placebo effect which has been shown to play a big role in psychotropic medications, and there was no statistical adjustment for Base Rate or well-known Spontaneous Remission or Cycling of some symptoms. Second, the reductionistic thinking of equating over 20 types and varieties of depressive diagnoses is simple minded in the least and mercantilism and marketing in a most offensive and morally questionable way.

In ADHD stimulant medications the National Institute of Health (NIH) reviews the tolerance literature and reports that 24 percent of patients developed tolerance to the drugs (pooping out) in days to weeks. NIH concluded that, "Long term follow-up studies demonstrate that medication response may lessen over longer durations of treatment in a high percentage of patients (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9332474/)[14]. Still, I frequently treat these patients and their families who report that even though they report pooping out of the medications to the physician, the doctor continued the medication, or a similar in class medication for years. We can only conclude that this is inadequate, inappropriate, or even unethical and self-serving clinical intervention. Further, most apply "medication-only techniques" to these patients, and upon careful diagnoses over half of them have been misdiagnosed and are other serious mood disorders and serious psychological illness. Unfortunately, the medical establishment, Government, and TORT law systems appear to look the other way and do not enforce adequate treatment or hold prescribers of

these partial and self-serving treatment approaches accountable. Without such a commitment and deterrent consequences we find patients robbed of years of effective diagnoses and comprehensive mental health treatment and destined to a life's course that is unnecessary and preventable. For a review of the literature in this regard that has been around for years see my Blog commissioned years ago by The American College of Lifestyle Medicine (www.lifestylefacts.com).

I could go on and on identifying more classes of drugs with tolerance or pooping out effect. But the real point is that you can't trust physicians and drug companies to be the arbiters of "the limits of pharmacological interventions," to refer for more comprehensive change and health-oriented treatments of psychotherapy, family therapy, lifestyle interventions, and true scientifically-based psychoeducation. Most physicians make their money colluding with the drug companies in several insinuations and marketing and mercantile approaches. We need ethical enforcement, professional dissemination of related and science-based ethical standards, and continued education of patients. We can't repeat or tolerate the opioid crisis where few educated prescribers were held accountable and we pretended that the problem was "drug companies taking advantage of poorly educated and greedy physicians," We cannot go on rotating justification for minimally and short-term medication effects by "rotating the scientific theories one after another to fool the public when the public becomes educated about a passe and disproven theory that justifies the drug," We have seen very creative neurohormone theories, weight loss pharmacology, pain control through effecting areas of the brain having to do with "caring" rather than pain, hallucinogen theories, telomere theories, and neuroplaque reducing theories. They will just come up with another marketing device to sell drugs and are defining themselves as hucksters. The solution is good scientific training, good public education, enforcement, and changing the laws so you pay psychologists and psychiatrist prescribers for a 45-minute psychotherapy intervention that also includes medication prescription, and you expand prescribers to a larger workforce of medical psychologists.

I might add, many nutritional, supplement, and herbal approaches have the same early benefit and pooping out effects. Zealots for any of these quick and dirty short cuts for change are just "hopeful neurotics or psychopathology and behavioral-problems deniers" at best and charlatans or greedy predators at worst. At least the first has the redeeming quality of self-soothing through the defense of denial and short-term coping and enhancement of self-esteem. The latter is just immoral!

First, their advertising and monetarily reinforced physician projected attitude, behavior, and miseducation is geared toward "insinuation that the temporarily helpful and few symptoms in a syndrome focused medication technique is an adequate treatment plan"! Second, there is a tribal or in some area's cultish barrier to any other thinking, patient education, or approach, and extrusion of any psychologist, physician, or nurse practitioner who is more scientific and enlightened. Physicians in lifestyle medicine are poo pooed as a little silly or less scientific practitioners when they are actually the opposite. Thus, many medical systems are committed to blocking unfavored science while using short-term or even junk science. They have no respect for the prescribing psychologist or Medical Psychologist specialists who have more mental health and lifestyle diagnostic, psychotherapy training, and psychopharmacology training that general medical providers. They embarrass themselves by fighting these providers out of the needed psychotherapist and prescriber combination that is a solution. Finally, like so much in modern times, there is no substitute for quality education, courageous search for truth and reality, and moral and ethical living and healthcare practice!

Summary: The USA medical establishment and medical industrial complex made up of physicians, pharmaceutical houses, and the USA hospital system have spent millions on misleading marketing, blocking any real alternative ideas and training, and have neglected responsible patient education and rules and laws. Clearly, medications are an important and scientifically validated acute care "technique" but not a treatment plan. Ethical, scientific and accurate prescribing would be to first refer for a doctoral behavioral-health specialist diagnostic workup that would allow for research-proven diagnostic specific treatment plans that would include psychotherapy (often individual and family), medication management, and lifestyle and behavioral paradigms. The ethical practitioner would be able to do "informed consent" in educating the patient on the uses, limitations, and acute nature of psychotropic medications, and on the importance and value of the neuroplasticity of the nervous system upon which the personality sits and the hope and avenues of growth and change. The patient should ethically and professionally be educated about the multi-pathway development of mental illness, the multi-pathways that must be addressed in a viable treatment plan, and the seminal figures in their environmental context should be included, educated, and participants in change.

Structural changes and behavioral reinforcers encouraging greed, misinformation, and malpractice include changes to pay psychologists and psychiatrist prescribers for a 45-minute psychotherapy intervention that also includes medication prescription and management, and you expand prescribers to a larger workforce of medical psychologists. In this behavioral paradigm, psychotherapy, lifestyle interventions, and medication management are all essential components of psychotherapy for qualified psychologists and psychiatrists and the unrealistic treatment of mental disorders by general medical providers is minimized. Empower patients by requiring true "patient education and informed consent for treatment plans" and hold doctors accountable who provide poor, misinformed, or contrived and manipulative information for patients. Empower the legal profession to hold doctors accountable, as well as empowering Government contractors and payer sources, and provide national education about mental illness and appropriate treatment.

To the naysayers: "Ask yourselves why this would be so difficult and upsetting to the medical industrial complex and to patients who just want their drugs?

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A Developmental Perspective of Psychopathology: Adversity, epigenetics, and treatment implications

Ward M. Lawson, PhD, ABMP, ABPP

Abstract

Very few diseases are entirely genetic in origin. Common and costly disorders like heart disease, cancer, diabetes, obesity, rheumatoid conditions, autoimmune conditions, mental illness, addictions, etc., have predisposing genes, but significant psychosocial factors, e.g., personality, stress, lifestyle factors such as diet and exercise, and toxins, etc., influence phenotypic expression through the process of *epigenetics*. Epigenetics activates and deactivates genes, or, in other words, switches them on or off. *Neuroplasticity* is the special term for this process in the brain, revealing how the brain changes with experience. This reality is vital for healthcare practitioners of all types to understand and communicate to patients to instill hope and mobilize them to take an active role in their healthcare. Further, it argues for wholistic, integrated care. This article briefly reviews some of the factors that negatively and positively influence epigenetics and neuroplasticity and provides guidance for Medical Psychologists regarding wholistic treatment planning.

Introduction

The Human Genome Project launched in 1990 had the goal of identifying and mapping all the base pairs that make up human deoxyribonucleic acid (DNA) for the purpose of determining the genetic roots of disease and develop treatments.

However, the search for the source of disease in the genome was doomed to fail. Why? Because very few diseases are solely genetic. The most common and costly disorders, such as heart disease, cancer, diabetes, obesity, rheumatoid conditions, autoimmune conditions, mental illness, addictions—none of them are purely genetically determined, but significant psychosocial factors, e.g., personality, stress, lifestyle factors such as diet and exercise, and toxins, etc., influence phenotypic expression. For example, germline mutations in *BRCA1* and *BRCA2* and a few other rare variants account for 15-20% of breast cancer that clusters in families and less than 5% of breast cancer overall.[1] Similarly, the Framingham study clearly showed that certain personality traits (“Type A”) raised one’s risk of heart disease. Indeed, there are monogenic, Mendelian disorders, but in fact, these are very rare diseases, extremely sparsely represented in the population. For example, Down’s Syndrome affects one in 1,100, and Cystic Fibrosis affects 1 in 100,000. Actually, many genetic disorders require several million births before there is but one case. Most complex conditions do have genetic predisposition, but a genetic predisposition is not the same as predetermination.

Still, there is a widespread, yet inaccurate and dangerous notion that healthcare conditions are genetic. To the lay person, this has various subtle meanings. It is a deterministic view of life, one rooted in biology and genetics. Therefore palliative, medical care erroneously becomes the default intervention. Another subtle meaning is that since genes are the cause of disorders that are inevitable and immutable, it is pointless to expend resources or societal energies trying to treat those disorders.

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Epigenetics

An organism's complete set of DNA is called its *genome*. Contained in the nucleus of virtually every cell in the human body are 23 chromosomes, which contain a complete copy of the approximately three billion DNA base pairs, or letters, that make up the human genome. However, our genome is not just a string of DNA code that is set in motion at birth, never to change course. In contrast, by virtue of a multitude of internal and external factors that constantly influence each other, DNA continually interacts with the multitude of smaller molecules found within cells which can activate and deactivate genes, or, in other words, switch them on or off. *Epigenetics*, meaning "above genetics" is the study of this process.

In contrast to the century's old "nature versus nurture" debate, epigenetics is a historically recent integration of the two extreme positions. The term itself was introduced by Conrad Waddington in 1942 but it was mainly studied as part of developmental biology. Genes in DNA are expressed when they are read and transcribed into ribonucleic acid (RNA) which is translated into proteins by structures called ribosomes. Proteins are much of what determines a cell's characteristics and function. Epigenetic changes can promote or inhibit the transcription of specific genes. The most common way inhibition occurs is when DNA, or the proteins it is wrapped around, get labeled with small chemical tags. The set of all of the chemical tags that are attached to the genome of a given cell is called the *epigenome*.

There are a multitude of different epigenetic tags on the genome, but the most commonly studied is DNA methylation. Some DNA methylation marks, including those which decides cell type, are laid down very early in development and are faithfully replicated throughout life. Other DNA methylation marks can be influenced by the environment around us, for example, by exposure to nutrients, toxins, stress or other factors. Some of these, like a methyl group, inhibit gene expression by derailing the cellular transcription machinery by causing the DNA to coil more tightly, making the gene inaccessible. The gene is still there but it is silent. Boosting transcription is essentially the opposite process. Some chemical tags will unwind the DNA making it easier to transcribe, which ramps up production of the associated protein. In other words, cells and the DNA within are mutable, fluid and *plastic.* DNA tells the cell what to try to do, but epigenetics, via environmental input, actually determines the phenotypic expression.

Epigenetic changes are part of normal development. The cells in an embryo start with one master genome. As the cells divide, some genes are activated and others inhibited. Over time, through this epigenetic reprogramming, some cells develop into heart cells and others into liver cells. Each of the approximately 200 cell types in the human body have essentially the same genome. Further, the epigenome also mediates a lifelong dialogue between genes and the environment. This is why genetically identical twins can grow up to have very different lives. As twins age, their epigenomes diverge affecting the way they age and their susceptibility to disease. One might develop heart disease at 55 and the other run marathons.

Psychological factors, e.g., beliefs, can affect epigenetics. In one study, participants (regardless of actual genotype) were told they either had a genetic predisposition for reduced capacity for exercise or to overeat, or that they had a "protective" factor that would preserve their capacity to exercise and eat normally.[2] Participants' actual response to exercise and diet proved to be more in line with what they believed about their genotype than with their actual genotype. Subjects in the exercise group who had been told, almost always inaccurately, that their genes made them unlikely to respond well to exercise tired more quickly than before, and their oxygen uptake and lung capacity were significantly lower. In the diet

group, subjects who erroneously thought they had the protective variant of the appetite gene felt fuller after ingesting food than before and their bodies produced more of a hormone that increases satiety. In both cases, subject's beliefs about their genetic risks altered their physiological responses to the testing.

Moreover, maternal behavior has implications for their offspring's genetic expressions. Epigenetic changes can be detected in the blood cells of newborns that have been exposed to cigarette smoke during pregnancy and some of these changes are still detectable at age 50 and beyond.[3] Similarly, a mother's consumption of alcohol during pregnancy can set in motion epigenetic events associated with fetal alcohol syndrome and unique biomarkers in the child.[4] Meaney and colleagues[5] have shown that the licking behavior of rat mothers is essential for the growth of rat pups. Rat pups deprived of this touch for even one hour, DNA synthesis is reduced, growth-hormone secretion is inhibited, and bodily organs lose the capacity to respond to exogenously administered growth hormone. Rat mothers who do not nurture and lick their pups produce rat pups who are timid, nervous, avoid novelty, and are less healthy. Conversely, rat mothers who more frequently lick and groom their pups produce offspring who, throughout their lives, explore more, are less fearful, show milder reactions to stress, perform better cognitively as adults, and preserve their cognitive skills better as they age. Furthermore, it is the mother's behavior, not genetic profile, that produces certain offspring characteristics, including the fact these rats tended to raise their offspring the way they themselves were raised. In other words, these effects are transmitted intergenerationally, not through the genome but through behavior.

Thus, we can see early life experiences for animals are potent, and epigenetic changes can survive cell division which means that they could affect an organism for its entire life. This reality may be adaptive or maladaptive for the organism, and numerous animal studies indicate nurturing environments have protective effects, mild stress early in life promotes resilience, but harsh environments have deleterious effects.[6]

In the same vein, with regard to human beings, we know that childhood adversity and trauma is an epigenetic force and powerfully associated with serious physical and mental problems. The Adverse Childhood Experiences (ACE) study is an example of the relationship between social context, relationship quality, chronic stress, and epigenetic health outcomes.[7] A large, collaborative research project between the Centers for Disease Control and Kaiser Permanente studied over 17,000 volunteer Kaiser patients undergoing routine health screenings. The overall objective was to assess the impact of ACE on a variety of health behavior and outcomes, and health care use. The more adversity the individual reported occurred during their childhood (i.e., abuse, domestic violence, absence of a parent via separation, divorce, or incarceration, a disabled or mentally ill parent, etc.) the greater the likelihood of a serious medical or mental problem, namely, alcoholism and alcohol abuse, chronic obstructive pulmonary disease, depression, fetal death, illicit drug use, ischemic heart disease, and liver disease.

Neuroplasticity—Epigenetic effects on the brain

Knowledge of brain structure and function has developed rapidly in recent decades, with a corresponding rapid development of our understanding of how brain function relates to human behavior. The roles of specific areas of the brain in specific types of cognitive and emotional processes have been delineated in the complex pattern of interactions between specific areas of the nervous system required for thought and behavior. The processes at the molecular and cellular levels and their relationships to memory, cognition, and affect have been described with increasing clarity.

Like other organs, the brain is also influenced by epigenetics. *Neuroplasticity* is the brain's ability to adapt and change its structure and function with intrinsic and extrinsic factors. Neuroplasticity may refer to structural alterations in the brain on a large scale, such as cortical remapping and changes in total weight, or on a microscopic scale, such as changes in size and density of neurons and glia. At the single cell level, synaptic plasticity describes the changes in strength of existing synapses, in synapse number or size, or in morphological structures that contain synapses.

This is of great significance to psychologists. It is a well-established fact of neuroscience that experience and neural activity affects and shapes the individual's central nervous system during development and in the adult brain, and thus the behavioral expression of the individual. Environmental forces constantly impinge upon organisms, and that organism's brain is constantly being shaped, wittingly and unwittingly.

Formerly, the brain was likened to a computer, with fixed neuronal allotments and hardwired connections. Brain maturation, e.g., neurogenesis, proliferation, neuron migration, arborization, and pruning, were thought to stop at full development. In contrast, the neuroplastic paradigm also drew support from the discovery of neurogenesis in the adult human brain. Neurogenesis is neuron generation from neural stem cells and progenitor cells. It is key to neural development. Most active prenatally, neurogenesis populates the growing brain with neurons. However, neural stem cells exist throughout life in the adult brain[8]. They create new neurons, astrocytes, and oligodendrocytes, just as in the developing brain. Evidence exists from primates regarding neurogenesis in other ventricular areas and their incorporation into cortical and subcortical areas. The evidence base for neurogenesis includes its links to structural plasticity[9], axonal elongation and synaptic reorganization post injury[10,11,12] along with pre- and post- synaptic structural changes stemming from experience at any age.[13]

Neuroplasticity entails neural membrane health, proper neurotransmitter (NT) levels, and receptor viability. It is influenced by the immune system, chronic inflammation, and thoughts. Repeated reinforcement leads to strengthened neurocircuitry patterns, as expressed through learned behavior. Long-term-potentiation (LTP) is the most studied form of synaptic plasticity, and the one that, in mammals, is most closely linked to memory storage and learning. Certain protein families, namely, Brain-Derived Neurotrophic Factor (BDNF), Vascular Endothelial Growth Factor (VEGF), and Insulin-like Growth Factor (IGF), help regulate neurogenesis through increased cell birth, maturation and survival. Those proteins also affect glial cells.[14]

There are three types of neuroplasticity: 1) Injury induced, which is altered balance of brain activity due to trauma and through the process of recovery; 2) Developmental neuroplasticity, which pertains to immature brain cells being shaped by early life experiences; and 3) Activity Dependent neuroplasticity, which pertains to learning, memory, new connections emerging through experience, knowledge acquisition, and from intensive practice of a skill (e.g., musical). Incidentally, a large body of research on activity dependent neuroplasticity provides evidence that the brains of musicians possess structural and functional characteristics absent in non-musicians, which generally correlate to the age of commencement of musical training.[15]

While injury induced neuroplasticity is outside the scope of this chapter, the latter two will be reviewed, demonstrating in both animal and human models, favorable and unfavorable early life developmental and activity-dependent experiences are potent in regard to their ability to shape brain circuits and/or connectivity, and experiences can trigger adaptive or maladaptive response depending on the health and balance of those interconnections.[16]

Animal models

Evidence for structural plasticity in the healthy mature animal brain was initially provided through the "enriched environment" studies of Bennett and coworkers[17], based on the findings of D.O. Hebb that rats living as pets in a complex environment displayed enhanced problem-solving behavior.[18] Rats that lived for weeks in a spacious, complex environment filled with toys that were changed daily showed regions of increased thickness of the cerebral cortex. This was also true of aging rats.[19] Subsequent studies showed that cortical neurons increased dendritic branching and complexity in such an environment compared to normal laboratory cages along with increased numbers of glial cells and increased blood supply.[20]

Exciting evidence for brain plasticity came with the rediscovery of neurogenesis in the adult dentate gyrus[21] based on pioneering work of Kaplan[22] and Altman[23] and the studies of songbirds[24]. Dentate gyrus neurogenesis is stimulated by physical activity and environmental enrichment[25] and inhibited by chronic physical and social stressors.[26] Structural plasticity in the adult brain involving not only neurogenesis but also dendritic and synaptic turnover can be related to social interactions in the visible burrow system for rats[27] and in the tree shrew.[28,29]

Among the influences on brain structure and function that are most powerful in inducing plastic chains are social influences. The vertebrate brain appears to be particularly sensitive to social influences and the sensitivity may be especially acute in primates.[30] The circuitry implicated in social and emotional behavior is among those circuits that appear importantly shaped by experience, and early experience in these domains likely plays a key role in governing differences among individuals and their vulnerability or resilience to future adversity. Early stressful and nurturing environments have robust effects on the developing brain, some of which persist for the life of the organism.

Recent investigations have shown that both acute and chronic stress alter spine density and dendritic length and branching in brain regions such as hippocampus, prefrontal cortex and amygdala.[26] Measured by conventional neuroanatomical methods, the time course of these changes was found to occur over days and are largely reversible, at least in young adult animals.[26,31] Yet, a recent study using transcranial two-photon microscopy to examine neuroplastic changes in developing and adult mice revealed changes in multiple cortical areas within several hours of stimulation.[32]

The experience of chronic stress affects some rather predictable, distal brain regions and their relational circuitry. Prenatal stress impairs hippocampal development in rats[33], as does stress in adolescence.[34] While chronic stress impairs neurogenesis and causes dendritic atrophy in the hippocampus and medial prefrontal cortex[31], that same stressor causes dendritic growth in the basolateral amygdala (along with increased aggression and anxiety) and the orbitofrontal cortex.[26,35,36] Interestingly, there is structural neuroplasticity in the mesolimbic reward system that is affected by social defeat and leads animals to increased self-administration of drugs[37], and social defeat, along with maternal separation in infancy, increased the vulnerability to substance self-administration.[38] Drugs of abuse alter morphology of many brain regions, an example of activity dependent neuroplasticity.

Evidence for plasticity in human brains

Analogous to the Hebb and Bennett studies demonstrating enhanced problem-solving and brain structure changes in rats provided enriched environments, activity-dependent neuroplasticity is similarly evidenced in the study of the functional Magnetic Resonance Images (fMRI) of London cab and bus drivers who were found to have significantly larger right pos-

terior hippocampus than matched controls. The volume of that brain region correlated with years of experience/ proficiency.[39] Similarly, the structural and functional characteristics of musicians generally correlate to the age of commencement of musical training.[15]

Adversity and stress. As we have discussed, early environments (stressful or nurturing) have robust effects on the health of the organism's body and developing brain, some of which persist for the life of the organism. As we have seen, social/emotional anatomical structures and neural pathways are continuously being shaped by forces that interact with the nervous system during prenatal development and throughout life. The rationale for studying this phenomenon in the human brain is founded in the preceding sample of animal models that demonstrate experience -induced plasticity in animals. Most human work has focused on alterations in different indices of brain structure that can be measured with modern magnetic resonance imaging (MRI). Enduring functional alterations can also be assessed using fMRI and related techniques.

For humans, research has taken advantage of largely unintended environmental circumstances such as child maltreatment, or exposure to early stress, to investigate subsequent experience-dependent effects of stress on the brain. There is now a substantial corpus on the impact of stressful environments on the developing human brain and associated behavior.[40-45] For example, Pollak, Davidson, and their colleagues studied 31 physically abused and 41 typically developing teenage children via structural MRI scanning and found that the abused children had smaller orbitofrontal (OFC) volumes. Moreover, the more severe the social stress as reported by the abused children and parents was correlated with increasingly smaller OFC volume.[46]

The hypothalamic-pituitary-adrenal axis (HPA) are key brain structures involved in the stress response, especially cortisol as an output measure of this system. Corticotropin-releasing factor (CRF) plays a central role in the stress response by regulating the HPA axis. In response to stress, CRF initiates a cascade of events that culminate in the release of glucocorticoids from the adrenal cortex. Evidence that child abuse is associated with alterations in the epigenetic regulation of the glucocorticoid receptor was obtained in a study of postmortem tissue extracted from the hippocampi of suicide victims with a history of child abuse, compared to those with no abuse history, along with controls.[47]

Post-institutionalized (PI) children who were raised in impoverished orphanages in either Eastern Europe or Asia were compared to non-institutionalized children.[48] Subjects were 8.5 to 9.5 years old and the PI group were institutionalized on average at age 2.5 months. When the PI group was divided into those who were adopted early versus those who were adopted late (<15 months versus >15 months), the later adopted PI children were found to have significantly larger amygdale compared with the early adopted and control sample.

Similarly, a comparable pattern of results was found with children who had been continuously exposed to maternal depressive symptoms since birth. These children had significantly larger left and right amygdale compared to children with no such exposure. The mean depression score of the mother computed over seven years predicted amygdala volume of her child at age 10. In other words, higher levels of maternal depressive symptoms predicted larger amygdala volume in their children.[49]

Children exposed to early-life psychosocial deprivation associated with institutional rearing are at markedly elevated risk of developing attention-deficit/hyperactivity disorder (ADHD).[50] Severe early-life deprivation disrupts brain development resulting in cortical thinning in regions with atypical function during attention tasks in children with ADHD, including the inferior parietal cortex, precuneus, and superior temporal cortex.

Attention-deficit/hyperactivity disorder is also associated with atypical neural structure, including smaller volume of the prefrontal cortex (PFC) and basal ganglia[51-53], and reductions in cortical thickness across prefrontal, parietal, and temporal cortex. [54,55] Low self-esteem in humans has been associated with a smaller hippocampus, and impulsivity and poor executive function with a defective prefrontal cortex, and aggression and anxiety with an overactive amygdala.[56]

This inexhaustive compilation of illustrative studies are consistent with the idea that early life stress induces structural changes in the developing brain and is associated with psychopathology. The amygdala and prefrontal cortex and their interconnections have been strongly implicated in emotional regulation and wellbeing, and dysfunctions and/or structural abnormalities in their interconnections have been implicated in psychopathology. Specifically, the two most prominent structural findings from the human literature addressing Major Depression, Bipolar Disorder, and ADHD, suggest that amygdala volume is increased while sectors of the prefrontal cortex are decreased. Such a developmental pattern has been suggested to occur in the autistic brain as well.[57,58]

Treatment Implications

As we have seen, epigenetics effects one's mental and physical health status, for the better or worse, the changes can happen quickly, and they often endure. With specific reference to the vertebrate brain and neuroplasticity, life experiences, especially those that are repeatedly experienced, result in repeated neuronal firings of associated, applicable neurons, which lead to dendritic growth and enhanced connection to adjacent neurons, forming functional networks. LTP forms the cellular basis for adaptation to one's environment and the manifestation of personality, talent or skill sets in the individual, or conversely, poor adaptivity or under-developed but necessary life skills.

The reality of epigenetics and the amazing capacity of the brain to adapt to experience can be exploited for positive physical and mental outcomes. Third grade teachers insist on a year-long, high-repetition program for the learning of multiplication tables, aspiring musicians practice hours on their instrument, and integrated health care programs for cardiovascular disease or diabetes enroll patients in education sessions, conduct psychological evaluations and provide counseling or psychotherapy, address diet and exercise, discuss potential psychosocial factors that lead to noncompliance, and incorporate smoking cessation programs. Training and intervention throw gene switches.

Psychotherapy

As has been mentioned, experience shapes one's brain, and there is ample evidence that the brains of the mentally ill can be reliably differentiated from mentally healthy individuals.[57,58] Similarly, psychotherapy has been shown to result in measurable, structural brain changes in a positive way with corresponding symptom reduction. Thus, it is important to understand the neuroplasticity aspect of psychotherapy and the re-parenting and re-socialization of patients with damaged brains and personalities, often by several generations of exposure to immature parenting and family cultures, and their channeling of the patient into immature, stressful life contexts that further the brain de-evolution and stress. Though not an exhaustive review, the following are some examples in the literature that provide evidence for the relationship between psychotherapy, neuroplasticity, and positive treatment outcome.

In an important review, DeRubeis and colleagues present evidence consistent with the view that CBT enhances prefrontal function and via this enhanced prefrontal activation, amygdala activation is in inhibited.[59] de Lang and his team examined the impact of cognitive therapy for patients with chronic fatigue syndrome in a short-term longitudinal study.

At baseline these patients showed decreased gray matter volume compared with healthy controls. Patients then underwent 16 one-hour sessions of cognitive therapy and were rescanned following treatment. Increases in lateral prefrontal volume were found in the patients following treatment that were correlated with improvements in digit symbol substitution and in a choice reaction time task.[60]

Regarding PTSD specifically, there is evidence that structural changes in the brain, such as the shrinkage of the hippocampus, are reversible via CBT.[61] Moreover, the regeneration of the hippocampus correlated with the expression of a gene that balances the activity of the stress hormone cortisol at the cellular level. Thirty-nine individuals diagnosed with PTSD received 12 weeks of CBT, and a control group of 31 individuals who had been exposed to trauma, but who did not develop PTSD, received no therapy. The volumes of certain brain regions using MRI, along with blood samples to measure changes in expression of *FKBP 5* gene (implicated in the risk for developing PTSD and plays a role in regulating stress hormones), were measured before and after the 12 weeks. Compared with the control group, PTSD patients had lower *FKBP 5* gene expression, and smaller hippocampal and medial orbitofrontal cortex volumes, important brain regions involved in learning, memory, and emotional regulation. Twelve weeks later, the PTSD patients showed increased hippocampal volume and expression of *FKBP 5*. More importantly, these changes were predictive of clinical improvement.

Psychodynamic therapy has also been shown to effect brain structures.[62] As established above, subcortical structures, namely amygdala within the limbic system, is typically enlarged for those with mood disorders. In this study, limbic hyperactivity (e.g., amygdala, striatum, and basal ganglia) in depressed patients normalized after eight months of psychodynamic therapy with individually-tailored, novel stimuli. Specifically, the treatment group were presented with sentences describing each patient's current dysfunctional interpersonal relations. The sentences for the control group described major sources of personal distress without being attached to depression. Compared to the control group, the treatment group displayed significant reductions in amygdala activity.

In another study treating depressed patients with psychodynamic therapy, 16 recurrently depressed, unmedicated outpatients and 17 control participants were matched for sex, age, and education. Participants were scanned before and after 15 months of psychodynamic psychotherapy during which presentations of attachment-related scenes with neutral descriptions alternated with descriptions containing personal core sentences previously extracted from an attachment interview. Using neuroimaging, outcome measure was the interaction of the signal difference between personal and neutral presentations with group and time, and its association with symptom improvement during therapy. Signal associated with processing personalized attachment material varied in patients from baseline to endpoint, but not in healthy controls. Patients showed a higher activation in the left anterior hippocampus/amygdala, subgenual cingulate, and medial prefrontal cortex before treatment and a reduction in these areas after 15 months. This reduction was associated with improvement in depressiveness specifically, and in the medial prefrontal cortex with symptom improvement more generally.[63]

A study by Kumari and colleagues involving psychotic patients showed that (CBT) strengthens specific connections in the brains associated with the accurate appraisal of social threat, specifically, the prefrontal cortex and the amygdala. [64] Participants underwent fMRI imaging to assess the brain's response to images of faces expressing different emotions, before and after six months of CBT. Of significance was the finding that these stronger connections are associated with long-term reduction in symptoms and recovery eight years later.

Similarly, the brains of 26 healthy volunteers were monitored using fMRI before and after multiple computerized training sessions targeting emotional regulation.[65] During the training, participants were required to identify whether a target arrow points to the right or to the left, while ignoring the direction of arrows on either side of it. The researchers conducted a "resting-state fMRI scan" to assess connections between brain regions during no specific task and later during an emotional reactivity task in which they had to ignore negative pictures used to study emotion. Subjects who completed the more intense version of the training (but not the other participants) showed reduced activation in their amygdala, and increased connectivity between participants' amygdala and emotional regulation by the frontal cortex.

Mindfulness Meditation

Poor stress-coping contributes to the development of chronic diseases and accelerated aging.[66-68] In the pursuit of methods that improve stress management, a growing body of scientific research has been devoted to understanding the neurophysiological and cellular responses. Among them, mindfulness-based meditation practices, which intentionally cultivate frontal lobe driven attentional skills, have become an increasingly popular approach, with accumulating experimental evidence of beneficial effects on psychological, neurological, endocrine and immune variables.[69-74]

There is evidence that gene expression changes with meditation.[75] In this study, the effects of a day of intensive mindfulness practice in a group of experienced meditators, compared to a group of untrained control subjects who engaged in quiet non-meditative activities was investigated. After eight hours of mindfulness practice, the meditators showed a range of genetic and molecular differences, including altered levels of gene-regulating machinery and down-regulation of pro-inflammatory genes, which in turn correlated with faster physical recovery from a stressful situation. Of note, the changes were observed in genes that are the current targets of anti-inflammatory and analgesic drugs. Moreover, the extent to which some of those genes were downregulated was associated with faster cortisol recovery to a social stress test involving an impromptu speech and tasks requiring mental calculations performed in front of an audience and video camera. Interestingly, there was no difference in the tested genes between the two groups of people at the start of the study, and the observed effects were seen only in the meditators following mindfulness practice. The key result is that meditators experienced epigenetic alterations of the genome following mindfulness practice that were not seen in the non-meditating group after other quiet activities.

Mindfulness meditation promotes neuroplasticity in the areas of the brain that are important for the management of emotions, self-control, judgement and rational processing of internal and external information. Essentially, this is in the cortex and primarily the prefrontal cortex, which is typically under-developed and thin in the seriously mentally ill population. In a longitudinal study of 26 participants undergoing an 8-week training in mindfulness based stress reduction (MBSR) 69, MRI scans were obtained before and after the eight weeks of training. Reductions in perceived stress following MSBR were correlated with reductions in gray matter volume in the right basolateral amygdala that were obtained from MRI scans performed before and after the eight weeks of training. These findings suggest that plasticity-related alterations in brain regions implicated in stress can occur with as little as eight weeks of mindfulness meditation training.[76]

Exercise

A growing number of studies support the idea that physical exercise increases brain function throughout life.[77,78] In a meta-analysis that included a total of 59 studies (from 1947 to

2009) examining the relationship between physical activity and academic achievement in school-age children, the authors demonstrated significant and positive correlations between physical activity and cognitive outcomes.[79] In another meta-analytic review of 29 randomized controlled trials examining the association between aerobic exercise and neurocognitive performance in a group with a mean age of ≥18 years of age, positive association between exercise with attention, processing speed, and executive and memory function was also evident.[80]

In addition to benefiting healthy young adults, physical exercise is known to delay age-related cognitive decline. A randomized, controlled trial study that evaluated the association between exercise and cognitive function in 120 healthy participants aged over 65 showed that 6 months of exercise reversed age-related loss in hippocampus volume and improved performance in a computerized spatial memory task.[81] A meta-analysis including 42 studies (from 1966 and 2010) of cognitive interventions of exercise in 3,781 healthy older adults aged 55 and older concluded that aerobic fitness training improves cognitive performance.[82]

The beneficial effects of exercise extend beyond cognitive function. A plethora of evidence supports the notion that exercise can prevent or delay the onset of various mental disorders such as anxiety, depression, and posttraumatic stress disorder.[83,84] Several meta-analysis studies suggest that exercise could reduce depressive and anxiolytic symptoms in adolescents with clinical levels of mental illness.[85,86] The effects of exercise on mental health are dose dependent. In adults, a moderate amount of exercise exerts greater benefits in the mental health than low or high doses of exercise.[87] Further, exercise has been shown to be comparable to the effects of medication in the treatment of depression,[88] and for substance use disorders, there is convincing evidence to support the development of exercise-based interventions to reduce compulsive patterns of drug intake in clinical and at-risk populations.[89]

Exercise-induced neuroplasticity, resulting in structural and functional changes in the brain, have been reported in both human and animal studies. On a macroscopic level, resting MRI evaluation of human brain structure, showed that aerobic exercise, from several months to a year, increased brain volume in various brain regions, such as the prefrontal and temporal cortex,[90] as well as the hippocampus.[81] Compared to healthy adults with a sedentary lifestyle, higher gray and white matter cluster concentrations (Voxel-based analysis) in the subgyrus, cuneus, and precuneus regions are found in athletes of similar ages.[91] A functional MRI study suggested that aerobic exercise at least enhanced activity in the brain areas which are involved in attentional control tasks.[90] Moreover, twelve months of chronic exercise enhanced functional connectivity in the default-mode network and the frontal executive network.[92] The increase of brain regional volume and activity is thought to reflect an alteration in the number of neurons, synapses, and axonal and dendritic arbors, since numerous studies show microscopic changes as well. Exercise also modulates systems like angiogenesis and glial activation that are known to support neuroplasticity. In short, exercise helps to maintain a cerebral microenvironment that facilitates synaptic plasticity.

Sleep

Interest in the role of sleep health in the development and management of chronic diseases has grown. Notably, insufficient sleep has been linked to the development and management of a number of chronic diseases and conditions, including type 2 diabetes, cardiovascular disease, obesity, and depression.[93]

Clearly, finding ways to treat insomnia has important implications for health and well-being. Extensive research summarized in several meta-analyses[94-97] has shown that Cognitive

Behavioral Therapy-Insomnia (CBTI) produces improvements in primary insomnia equivalent to those achieved during acute treatment with hypnotic medications [98, 99] in terms of reducing nocturnal wakefulness, increasing sleep efficiency, and improving subjective sleep quality.[94,100] There is also some evidence that CBTI is effective for insomnia that is comorbid with depression.[101-105] Most important, sleep improvements achieved during CBTI endure up to two years after the course of CBTI is completed.[106] This attribute of CBTI is particularly important in the context of depression, as patients who remain insomnia free are likely to remain depression free for longer periods of time than those whose insomnia recurs.[107,108]

In terms of neuroplasticity, there is a general consensus that sleep is intimately linked to memory, learning, and, in general, to the mechanisms of neuroplasticity, and that this link may directly affect recovery processes.[109] In 1966, Roffwarg and colleagues[110] proposed that sleep held a key role in brain development and synaptic neuroplasticity. At that time, much less was known about how endogenous neural activity, intercellular molecular signals, and experience shape develop circuitry. Currently, many studies support a role for sleep in brain development, suggesting sleep influences the early formation of neural circuitry and its subsequent sculpting by experience. In fact, there has been a steady accumulation of positive behavioral, electrophysiological, cellular, and molecular evidence to support the hypothesis that sleep facilitates memory consolidation and brain plasticity.[111] Thus, even though neuroscientists disagree on how to integrate these findings to explain what mechanism sleep may achieve these functions, the findings offer ample support the recommendation of adding treatment interventions, such as CBTI, to optimize sleep for the purposes of neuroplasticity, if not for general health, or for those with anxiety or mood disorders.

Conclusions

Epigenetics is an important reality that affects all living things. Clearly, a wide variety of variables affect our health status on any given day, and people do not necessarily have to turn out the way they do. Some simple changes along the way may mean the difference between premature aging and disease, or good health and a long life. Similarly, epigenetic forces on the brain, i.e., neuroplasticity, powerfully influence personality and mental health. Formerly overattributed to health care disorders in an oversimplified, deterministic way, genetics are simply potentials and predispositions. This latest neuroscience debunks the genetic theory of mental illness, along with the often-used “chemical imbalance” theory, which is used to justify prescription psychotropics-only approaches to the treatment of mental disorders, simultaneously implying a genetic, unchangeable condition that only medication can address.

It is clear that adversity has deleterious epigenetic and neuroplastic effects on one’s physical and mental health. Healthy personality development is disrupted and inhibited by adverse life experiences, manifesting in patient complaints, symptoms, behavior, relationship problems, and corresponding with brain structure volumes and maladaptive ratios. Serious psychopathology, e.g., Bipolar disorder, Major Depression, ADHD, Schizophrenia spectrum disorders, predictably have brains with certain structures being quite larger or smaller compared to individuals without mental illness. Specifically, the developmental pattern established by the human literature indicates the two most prominent structural findings addressing Major Depression, Bipolar Disorder, ADHD, and the autistic brain are that amygdala volume is increased while sectors of the prefrontal cortex are decreased. Larger amygdala volume means the individual is more childlike and readily anxious, frightened, angry and generally more emotional, with simultaneous underdeveloped capacity to internally summon controls of those emotions, respond objectively to stressful situations, apply

analysis, or appropriately reflect on and evaluate cognition. The older, abstract concept of "developmental arrest" is now richer, backed by hard science, namely, the inclusion of predictable, maladaptive neuroanatomical features.

Operating from the biopsychosocial model and promoting integrated care among disciplines, the Medical Psychologist is in a unique position to bring to bear a variety of tools and interventions to capitalize on the reality of epigenetics and neuroplasticity. The Medical Psychologist not only applies advanced diagnostic, psychotherapeutic, and psychopharmacological skills in the treatment of patients, but understands that multiple factors influence epigenetics and neuroplasticity, and addresses as many of them as the diagnostic work-up indicates. In this sense, the Medical Psychologist is a *neuroplastician*. As we have seen, psychotherapy is not the only intervention that promotes neuroplasticity. Such factors include exercise, stress management, restful sleep, meditative practices, education, and counseling, elements of a comprehensive treatment plan the Medical Psychologist can personally implement or arrange for treatment team members to consult and address.

For the treatment of mental health disorders, instilling positive expectancy and *hope* for a better tomorrow is an essential, non-specific factor, irrespective of one's favored psychotherapeutic approach. Hope promotes an internal locus-of-control for the patient, and the mobilization of energy and consistent effort toward the treatment regimen. One important fundamental message from the Medical Psychologist to the patient is that hope can be found because of epigenetics and neuroplasticity. In can be communicated their disorder is like most health care disorders, that is, is it not genetically determined but primarily a function of adverse childhood experiences, parental extremes, and other stressors.

A second important message to the patient is that treatment can work. Scientifically engineered experiences and interventions can switch off maladaptive phenotypic states, overcoming developmental arrest via adaptive brain changes with resulting personality, behavior change, and psychological maturation. Through treatment, they can become "the master of their own brain," acquiring autonomous self-regulation capacity and learn effective coping skills, quietly supported by new, adaptive neuronal connections, bolstered autoreceptors, and functional networks via LTP. In other words, change is possible if one persists and consistently demands from oneself protective control over lifestyle, thoughts, social contexts and other experiences long enough for neuroplasticity to result in sufficient, adaptive cell assemblies. The Medical Psychologist's ability to build a long-term relationship with the patient is key, such that neuroplastic changes have sufficient opportunity to occur.

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