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BASIC EMOTIONS AND THEIR VICISSITUDES: ASSESSING SUBCORTICAL ACTIVATION PATTERNS WITH THE MCMI-IV

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Abstract

Theodore Millon's (2011) evolutionary theory describes a model of the affective profile underlying the personality of an individual human being. The general affective patterns which an individual exhibits are characteristic of one's personality, and specific instantiations of these affective patterns influence motivation and behavior at a given moment in time. Among clinical populations, this affective profile may be measured and described using the Millon Clinical Multiaxial Inventory, Fourth Edition (MCMI-IV). In this paper, I propose that the components of Millon's model may be correlated with the basic affective systems identified and described by Jaak Panksepp (1998) and others. Panksepp's work serves as a primary theoretical and empirical basis for the bourgeoning fields of affective neuroscience and neuropsychoanalysis. I suggest that investigating the correlation between Panksepp's basic affective brain systems and Millon's personality profiles will provide insight into the neurological factors influencing the etiology of clinical syndromes. An investigation such as this promises to open new avenues for the neuropsychological assessment of subcortical functioning. In this paper, a method is proposed for interpreting MCMI-IV personality profiles as describing the arousal and inhibition of the primary affect systems identified by Panksepp, and the ways in which motivational forces mutually influence and interact with these processes. An illustrative case is reported in which the fluctuating mood states of an individual with bipolar disorder are interpreted as being structurally and functionally determined by personality patterns, which are themselves characteristic patterns of arousal and inhibition of basic neural affective systems. Hypotheses are presented which indicate potential areas of future research relating to the ways in which basic affect systems form interacting functional clusters.

Keywords: *Affective neuroscience, neuropsychological assessment, MCMI-IV, clinical psychology, neuropsychoanalysis.*

1. Introduction

Affective neuroscience is a developing branch of empirical research which has established that numerous "primary" affect systems, which predispose organisms to enact specific behaviors under certain conditions, have arisen over the course of the evolution of the mammalian brain (Panksepp, 1998; see also, LeDoux, 2012). It has been proposed that these primary affective processes constitute a fundamental level of personality functioning (Davis, Panksepp, and Normansell, 2003). Such a position is consistent with the evolutionary theory of personality developed over the course of many years by Theodore Millon, which forms the theoretical basis for the widely used Millon Clinical Multiaxial Inventory, Fourth Edition (MCMI-IV) (Millon, Grossman, and Millon, 2015). Millon's (2011) theory proposes that the personality is a stable psychological structure which mediates between physiological and environmental stimuli on the one hand and characteristic behaviors, including psychopathological syndromes, on the other. However, Millon does not provide a detailed account of the physiological determinants of personality, despite quite clearly maintaining that they make essential contributions. Therefore, if we accept the validity of Millon's theory—which we do implicitly when we utilize the MCMI-IV in clinical practice—it is natural to be interested in investigating the nature of the physiological factors which determine the structure of the personality. I propose that certain theoretical affinities exist between Millon's theory and the models of primary affect systems supported by work in affective neuroscience, which is to be expected if we accept that both have empirical support. In what follows, I provide an overview of these topics and explore ways in which results obtained from the MCMI-IV might be interpreted as providing information about the functioning of the neural systems which underly primary affective processes.

2. Primary affect systems

It is a basic tenet of affective neuroscience that the brain contains innate networks subserving mechanisms for a variety of behavioral responses, and that, ultimately, every behavior of which an organism is capable is subserved by functional combinations of these networks. The behavioral potential of the human organism is immeasurably great, and any attempt to construct a functional taxonomy of human behavior will necessarily be approximate and incomplete. Nevertheless, affective neuroscience—as well as numerous other contributions from network neuroscience and related fields—has identified a limited number of neural systems which subserve evolutionarily determined functionality. All possible behaviors must be the result of various learned associations between the functionality of these basic systems, and these systems must interact efficiently in order for the organism to function optimally. Needs which arise in the body stimulate specific hypothalamic nuclei, in turn causing the stimulation of more broadly distributed subcortical networks. The complex, conditioned activation and interaction of these networks motivate the organism to act in such a way as to satisfy salient physiological needs. The satisfaction of needs results in the cessation of the autonomic stimulation which motivated the behavior. All motivation has its origins in the activation of these basic systems, which are in turn stimulated by afferent autonomic communications signaling the allostatic states and needs of the organism as a whole.

The primary basic emotion networks posited by Panksepp (1998) are SEEKING, RAGE, FEAR, LUST, CARE, GRIEF, and PLAY, which have been described and elaborated in the extant literature. In brief, SEEKING is a generalized arousal system primarily consisting of ascending dopamine structures; it is largely coextensive with the classical "reward system" (Wright and Panksepp, 2012) and is activated whenever the allostatic state of the body requires the organism to actively engage the environment in order to obtain satisfying resources. RAGE, which is mediated by a descending network including the medial amygdala, medial hypothalamus, and periaqueductal grey (PAG), is activated in response to frustrated efforts to secure desired resources and causes the organism to become confrontative and aggressive. FEAR is responsible for the recognition of and reaction to external threats to the organism; it is closely related to RAGE both anatomically and functionally and is mediated by a similar descending network from the central amygdala through the medial hypothalamus and PAG. (Together, FEAR and RAGE are believed to mediate the well-known fight-or-flight responses of the threatened organism). LUST, which mediates sexual behavior, is highly sexually dimorphic (although less so in humans than in other mammals); in males it is centered in the preoptic hypothalamus and manifests in motivated approach behaviors, whereas in females it is centered in the ventromedial hypothalamus and manifests as expressive receptivity. The CARE network mediates non-sexual bonding and attachment, originally between mother and infant, and is widely distributed across the subcortical brain; essential nuclei include the bed nucleus of the stria terminalis, preoptic area, ventral tegmental area (VTA), and PAG. GRIEF (formerly termed PANIC) is an independent system which generates dysphoric affect under circumstances of social isolation and relational loss, thereby providing, among other adaptive benefits, powerful negative reinforcement for social affiliation and attachment; subcortical nuclei instantiating GRIEF largely overlap with the CARE system, although with the inclusion of the dorsomedial thalamus and with less participation from the dopaminergic structures of the VTA. Lastly, PLAY is a diverse system with evolutionary origins in rough-and-tumble play but which, in humans, subserves a broad range of affiliative social behaviors, social learning, and the psychic representation of interpersonal boundaries; unlike the majority of primary affective systems, which are organized primarily around hypothalamic processes, PLAY is mediated to a significant extent by networks centered around the dorsomedial and parafascicular nuclei of the thalamus, with abundant contributions from other regions associated with movement and somatic posture including the vestibular system, the cerebellum, and the basal ganglia.

3. Millon's evolutionary theory

Separately, Millon (2011) developed a theory which uses an evolutionary framework to explain the development, structure, and functioning of the human personality. This theory posits that the mature human personality consists of a network of interacting patterns of behavioral dispositions which I propose may be characterized as being similar to transference positions or cognitive-behavioral schemas. Larger crystallized patterns of behavior are unique to the individual and are considered to be relatively stable dimensions of the personality. These gross personality structures, however, are constituted by more basic systems which Millon describes as consisting of three interacting polarities, which represent the fundamental level of personality functioning. The three polarities are determined by (1) whether the individual is motivated more by seeking pleasure or avoiding pain, (2) whether the individual is

motivated more to passively adapt to or actively modify the environment, and (3) whether the individual is motivated to respond more to the needs of the self or the needs of others. It can be surmised on the basis of neuroscientific findings (see, e.g., Kernberg, 2015) that the pleasure-pain and active-passive polarities relate primarily to subcortical arousal and motivational states, whereas the self-other polarity relates to the distribution of cortically based associative processes which constitute the objects of these subcortical motivational drives. Additionally, it is notable that Millon's tripartite model is explicitly derived from that posited by Freud (1915), and the noted corroboration of this model by recent developments presents promising possibilities for reinterpreting and elaborating Freudian instinct theory in the light of modern neuroscience.

Dynamic interactions between Millon's (or, rather, Freud's) polarities give rise to structural and functional characteristics which describe the cognitive, emotional, and behavioral dynamics that are typical of each higher-order personality dimension, as well as the affective and motivational context under which each personality dimension becomes activated. Moreover, the present author suggests that there is a prima facie correspondence between the above referenced putative localization of these polarities in the brain (see reference to Kernberg, 2015, in previous paragraph) and the localization of the basic networks described by Panksepp's affective neuroscience. This proposal suggests that there is an inherent affinity between the biophysiological orchestration of the organism as proposed by affective neuroscience and the biopsychological orchestration of the personality as proposed by Millon's evolutionary theory, and, further, that this inherent affinity underlies the phenomenological ontology of dual-aspect monism that has been posited by many researchers in recent decades and centuries, including pioneers in the field of neuropsychoanalysis (see, e.g., Solms and Turnbull, 2011).

4. Clinical applications

The MCMI-IV is a widely used and psychometrically validated instrument for assessing the dominant patterns of personality exhibited by individuals in clinical populations. The Millon personality dimensions may be thought of as cognitive-behavioral schemas, which may remain characteristically (and, in the extreme form, pathologically) activated so long as the requisite motivational arousal of the individual permits. However, changing circumstances in both the environment and the internal milieu will prompt a transition from one schema to another more suited to the developing situation. (Note that it is hypothesized that these transitional processes occur in accordance with a model proposed by Lisa Feldman Barrett and colleagues [see, e.g., Barrett, 2017], in which behavior is orchestrated by a process of prediction and error correction; this unfortunately cannot be elaborated further here). For example, the Apathetic-Asocial-Schizoid personality dimension (MCMI-IV Scale 1) is characterized by emotional impassivity, interpersonal disengagement, and apathetic mood (Millon, 2011, p. 281). The affective profile of the schizoid personality indicates marked indifference to both pleasure and pain (hypothesized here to involve downregulation of affectivity in general and perhaps primarily of SEEKING with respect to pleasure and of GRIEF with respect to pain). This broad suppression of affect leads to a strong tendency to passively conform to the prevailing circumstances (yielding the additional downregulation of FEAR and RAGE) and a lack of motivation to pursue interpersonal contact with others (yielding the additional downregulation of CARE, PLAY and LUST). Any circumstance in which this kind of attempt to regulate the basic affective systems (through downregulation) becomes ineffective will lead to a transition to an alternative schema which is more adaptive to the prevailing context. In the case of a severely disordered personality which has no alternative personality positions available, the individual is presumably liable to decompensate into a borderline or psychotic state of functioning (such an individual is predicted to show elevations on the MCMI-IV's Severe Personality Scales). Given the empirically supported presumption that the MCMI-IV provides a reliable estimate of one's characteristic behavioral schemas and the affective circumstances under which each schema will become activated, this author hypothesizes that the MCMI-IV will provide information about the distributed activations of the various systems described by affective neuroscience when specified circumstances obtain.

Consider the case of a 31-year-old man who was measured by the MCMI-IV to have high elevations on the Antisocial (BR 83), Histrionic (BR 80), and Narcissistic (BR 75) scales, with somewhat lower but still notable elevations on the Masochistic (BR 70) and Negativistic (BR 65) scales. Additionally, he scored highly on Bipolar Spectrum (BR 90) as well as on Alcohol Use (BR 98) and Drug Use (BR 88). The personality structures which underly this individual's manic and depressive mood tendencies are hypothesized to be represented by two clusters of the personality scales noted above: the manic patterns being structured by scales 4A, 5, and 6A, and the depressive patterns being structured by scales 8A and 8B; note also that this hypothesized depressive constellation appears to be a rather atypical agitated-dysphoric depression that is quite unlike a more familiar melancholic depression). This hypothesis is based in part on the prior hypothesis that the scales constituting the "manic" cluster are

likely to entail moderate or higher activation of the SEEKING system, whereas the scales of the "depressive" cluster entail weak activation of the SEEKING system, as well as higher activation of aversive affects such as GRIEF, FEAR, and especially RAGE (directed toward the other in the Negativism schema and toward the self in the Masochism schema; note that these dynamics in particular appear to be quite complex and are deserving of extensive treatment in their own right).

I hypothesize that when this individual is experiencing manic mood states, he will exhibit behavioral tendencies consistent with the Histrionic, Narcissistic, and Antisocial scales as described in Millon's theory. These states are distinct, but are all three characterized by features that are consistent with a steadily activated SEEKING system, as indicated by a pleasure polarity in the average range, leading to self-stimulated activity in the interest of satisfying internally motivated desires. Furthermore, the activity associated with scales 4A and 6A are consistent with SEEKING arousal; the passivity associated with scale 5 is accounted for by the hypothesis that in this case the SEEKING system has taken the individual's self-representations as its object, thus remaining activated without any apparent motivation to act efficaciously upon the environment. Affective systems beyond SEEKING are likely to be more selectively activated across these three schemas. For example, the characteristics of the Histrionic schema suggest that, when engaged, the individual will be actively involved in pursuing goals and warding off frustrations, both of which will be prioritized with respect to interpersonal relationships along the CARE-PLAY-LUST axis. Given the moderate elevations of this individual's depressive cluster, it seems plausible to speculate that these affiliative activations are maintained largely as a defense against the aversive effects of GRIEF, FEAR, and perhaps RAGE (although, as noted by Panksepp [1998, p. 194], the characterization of RAGE as strictly aversive is dubious). The three schemas in this individual's manic cluster represent three positions which he can assume in an ongoing defensive chess game. When his manic constellation is "checkmated" by his FEAR and GRIEF systems, a transition occurs in which he shifts from the manic position to the depressive position, in which dysphoric affect reigns supreme and frequently gives way to RAGE, which is internalized and, as noted above, is turned either against the other (in the Negativistic position) or against the self (in the Masochistic position).

The transition from one schema to the next within the manic cluster is likely influenced, if not fully determined, by the orientation toward interpersonal interaction (Millon's self-other polarity). When this individual is motivated, for complex personal reasons derived from the conditioned association of numerous basic affective systems and environmental contingencies, to seek interaction with others, this will be actively pursued and characterized by a continuum of social approach behaviors, ramping up to dramatic, attention-seeking behaviors and gregariousness, likely as the strength of the GRIEF and FEAR responses against which one is defending increase. The primary defensive response is to upregulate affiliative affective systems (CARE, PLAY, LUST) in proportion to the aversive affect against which he is defending. These systems are activated and directed, with increasing superficiality, toward readily available sources of gratification in the environment. An abrupt shift is expected, however, when this individual's motivated interest switches to himself, likely after a desired object has become unavailable. When motivated, or required, to pursue his own goals—a motivation which is incompatible with his shallow histrionic displays of interpersonal charm—one of the other noted schemas will be engaged depending on whether the specific motivated behavior requires an active or a passive stance.

The Narcissism schema is likely activated subsequent to a threshold arousal of GRIEF when a desirable external object for the above-mentioned Histrionic drives is unavailable, and the affiliative affective systems (CARE, PLAY, LUST) become activated in conjunction with neural instantiations of the self-representation rather than the now-downregulated (because sensorily and predictively absent) object representations. In other words, the individual shifts affective attention (or, we might say, cathexis) from other to self in order to maintain both activation of the positive affect system and defensive inhibition of the painful GRIEF system. This leads to a self-satisfied inertia which likely appears to others to be a downregulation of affect, although the subjective experience of the individual almost certainly remains highly affectively vibrant. Behaviors motivated by the Antisocial schema, on the other hand, likely appear to others to be a loosely connected series of random and impulsive acts, although the subjective experience of the individual is again one of perfect internal coherence in accordance with the salient motivations of the self—again rising to the pathological exclusion of the other. Although the individual in the example case shows no evidence of violent or aggressive acting out—as is consistent with the absence of remarkable elevation on the Sadistic scale (BR 45)—the Antisocial scale, characterized by impulsive and irresponsible behaviors and active arousal, is likely associated with high activation of the SEEKING and PLAY networks, under the special condition of taking the self as their object alongside the total neglect of the other. Collateral activation of the RAGE network also cannot be ruled out, at least under certain circumstances. Thus, it is quite likely that this schema is the most closely associated, in our example case, with this individual's high levels of substance abuse, and in conjunction with the Narcissistic schema may explain why he was willing to disclose these issues so openly.

Alternately, Antisocial activation may simply represent high SEEKING arousal in the interest of the self-complex, with a blatant disregard both for considerations of the other as well as for aversive stimuli encountered in the pursuit of such motivational aims.

It should be noted that in the Histrionic and Narcissistic positions especially, this individual will frequently be able to tolerate some level of aversive stimulation, and at low levels of dysphoric arousal these schemas are likely to give the appearance of a relatively adaptive socialization and confidence. Increasing dysphoric affect, however, will require an ossification of the manic defenses, resulting in maladaptive histrionic or narcissistic behaviors. When these become untenable, a transition into the Antisocial schema, with its characteristic downregulation of sensitivity to GRIEF, will permit the individual to maintain an indifference to the aversive stimulation, especially of the sort that is interpersonally mediated. As noted, however, there may be times when this defensive move is itself untenable, as when the aversive context is such that it simply cannot be ignored, which will of course lead to a decompensation into the state of agitated depression.

5. Conclusion

In conclusion, Millon's evolutionary theory clearly endorses the perspective that ingrained personality patterns provide the soil out of which behavioral manifestations emerge, whether these behaviors are adaptive or pathological. I have described how I have used results obtained from the MCMI-IV to construct models of individual functioning in clinical cases, with reference to identified subcortical brain networks. As described by the findings of affective neuroscience, the brain processes underlying personality functioning are alternately activated and inhibited on the basis of subcortically originated affective arousal, the vicissitudes of which will continue to provide the basis for productive research for many years to come. However, while the basis in Millon's theory provides a strong advantage to the MCMI-IV over other presently available instruments, this was not the intended purpose of the MCMI-IV. This instrument therefore has numerous imperfections and shortcomings with respect to these goals. Among these shortcomings are that the guidelines for interpretation provided by the test publisher limit interpretability to only the most highly elevated scales, which appears to be somewhat arbitrary and makes little practical sense. Moreover, the interpretability of low scale scores is ambiguous. Nevertheless, the theoretical and empirical foundation of the MCMI-IV is strong, and its broad range of personality dimensions provides the test with high practical utility. I believe that the field of clinical psychology would benefit from the development of a new instrument which is theoretically grounded in an integration of Millon's personality theory with the tenets of affective neuroscience that have been described. The first step in realizing such an integration, prior to constructing such an instrument, must be to clearly elaborate the structure of and interactions between the cortical and subcortical networks which contribute to Millon's three polarities. A thorough overview of recent developments across the neurosciences reveals that such an objective is very much within reach at present. The subsequent development of an assessment instrument which is designed to measure the activations and interactions of these networks will allow the field of clinical psychology to remain relevant and even indispensable in a rapidly evolving clinical landscape by demonstrating the foundations of its constructs and theories in measurable physiological processes which can inform both psychiatric and psychotherapeutic treatments.

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