

# The Rational Unconscious: Implications for Mental Illness and Psychotherapy

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The unconscious mind is frequently viewed as consisting of irrational processes. Given that much more brain activity occurs unconsciously than consciously, approximately on the order of 20 to 1, it is doubtful even at a surface level that there is no rational aspect to unconsciousness. This article outlines rational and hence reality-congruent unconscious processes facilitating adaptive functioning: emotional and nonemotional information processing, action preparedness, psychological defense mechanisms, cognitive regulatory control processes, and human-specific cognition (negative symptoms).

In total, these processes make for a highly rational unconscious, providing further support for the prominence of the unconscious mind. The implications for mental illness and psychotherapy of each rational unconscious process are outlined. With this knowledge, psychotherapists can more effectively guide interventions to improve mental health.

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Psychoanalysts have for many years emphasized the importance of the unconscious mind. Freud believed that consciousness represents only a small portion of mental activity (1). Modern-day neuroscience research supports this position: The energy consumed by unconscious active messaging, referred to as the *default mode network*, occurring during sleep, daydreaming, anesthesia, and other states, is 20 times greater than the energy used to respond consciously (2, 3). Consistent with this energy imbalance, many aspects of mental life, including motivation and cognitive and emotional information processing, appear to be largely unconscious (4).

Consciousness and unconsciousness are often thought to be distinguishable by attention, but unconscious mental activity also involves attention. The interesting phenomenon of blind sight reveals how unconscious attention occurs. With blind sight, people with damage to the occipital cortex, who are blind in any conscious sense, are able to navigate around a room full of objects without conscious attention (5, 6). At some unconscious level, rudimentary visual sensory images that are likely bypassing the occipital cortex are attended to, and appropriate responses are executed (5, 6). Hence, attention cannot be used to distinguish consciousness and unconsciousness. Awareness, though, does seem to be restricted to consciousness, and people are unaware of unconscious states (7).

Despite attention occurring unconsciously, mostly irrational processes are ascribed to the unconscious, such as primary process thought, the pleasure-unpleasure principle, exemption from contradiction, no doubt or uncertainty, and instinctual impulses and energy (1, 8, 9). In contrast, rational

processes are seen as being conscious, including secondary process thought, reality principle, rational-logical thoughts, doubt and uncertainty, and representations of impulses (1, 8, 9). A more reality-congruent and logical, rational component applies to conscious functioning, whereas the unconscious mind is seen as being less reality congruent and more irrational. Unconscious processes are diverse, and many do indeed fit this characterization. However, several unconscious processes are also very rational and, hence, reality-congruent. These additional aspects expand the role of the unconscious and reinforce the prominence of unconscious mental activity. The purpose of this article is to describe the more rational and reality-congruent aspects of unconscious system functioning and also to explore how these aspects affect mental illness and psychotherapy. I cover five categories of unconscious rational functioning: information processing, action preparedness, psychological defense mechanisms, cognitive regulatory control processes, and human-specific cognition.

## INFORMATION PROCESSING

The phenomenon of blind sight indicates that attention, a prerequisite for information processing, characterizes the unconscious mind (5, 6). Unconscious information processing clearly occurs with blind sight, based on attention to rudimentary visual images (5, 6). Subliminal information processing also occurs unconsciously (10, 11). For example, Lau and Passingham (10) instructed participants to prepare either a phonological or a semantic judgment on an incoming word. During some trials, they were subliminally primed to

do the opposite, and on these trials brain activity in areas relevant to the main task was reduced, whereas activity related to the primed task was enhanced. Also demonstrating unconscious information processing is the Poetzl effect: When the overall information content of an event overwhelms conscious information processing capacity because of restricted exposure conditions, unconscious encoding of the consciously missed information can occur, and this information subsequently reemerges in dreams, fantasy, drawings, imagery, word association tests, and responses to Rorschach materials (12). With both subliminal information and the Poetzl effect, the relevant information must be attended to and processed unconsciously.

The information processing function of the unconscious has been referred to as the “cognitive” unconscious (13). At a concrete level, the unconscious regulates various crucial physiological states, such as heart rate, blood pressure, temperature, and blood sugar levels, taking in information from diverse sources throughout the body and responding. In addition, Eagle (13) has indicated that some processes below the level of awareness seem capable of carrying out highly complex and intelligent operations, such as the semantic analysis of a stimulus. Consistent with this perspective, the unconscious might even be better at making decisions in complex scenarios (14–16). For example, Dijksterhuis (14) presented participants with information about four apartments, each described by 12 different aspects. After participants read all the information, they followed one of three procedures: Decide on the apartment they wanted right away; think over their choice consciously without distraction; or perform a very taxing working memory task preventing conscious thought and then make a decision once the task was completed. Better decisions (more positive and fewer negative features) were actually made by the last group, who were likely only processing the complex information unconsciously (14). This result might have occurred because unconscious attention appears to be more parallel, allowing simultaneous processing of different information streams (9, 15). Consciousness attention is limited, such that only one focus can occur at a time, unless others are completely automatic (7). The capacity of the unconscious to process complex and multifaceted material might then be significantly greater. This capacity likely also accounts for implicit learning occurring in the absence of consciousness.

Another aspect of information processing that occurs largely unconsciously pertains to emotions. Research strongly suggests that some form of cognitive activating appraisal is involved in the vast majority of, or even all, emotional responses (17–19). When loss is perceived, sadness occurs (20–22). Fear arises when cognitive activating appraisals detect threat or danger (20, 21). Anger involves the perception of violation or damage (23–25). Disgust is indicative of some form of contamination, whether physical or moral (25–27). Shame occurs when cognitive activating appraisals detect the commission of a significant moral transgression (28). Surprise indicates the sudden presence of an

unexpected occurrence, either positive or negative (29, 30). Happiness involves a perception of gain or success (24, 31). Interest arises with the detection of something offering the potential for reward (29).

When cognitive activating appraisals detect these so-called deep structures, the corresponding emotion arises (17). Deep structures reflect realistic scenarios associated with important resources and are in this way reality-congruent (32). Cognitive activating appraisals can occur consciously, as for example a person thinking, “He took advantage of me,” leading to the perception of violation and a feeling of anger. However, a quick consideration of the numerous emotions people experience throughout any given day reveals that only some involve conscious thoughts. In many instances, these thoughts are completely unconscious and are influenced by people’s early life experiences, wishes, needs, urges, and defenses interacting with current circumstances. Psychotherapy is often required to bring these thoughts to consciousness where they can be focused on, such as with cognitive restructuring or psychodynamic interpretations.

Once therapists appreciate how rational emotional information processing is, greater advances in therapy are possible, on the basis of deciphering the thoughts underlying emotions. For example, if a person is frequently angry, then that person unconsciously and consciously perceives many instances of violation or damage. By having the person restructure his or her perceptions by consciously generating alternative interpretations other than violation or damage, the person will become less angry. For example, when a passenger pushes past a person as he or she exits a subway car, an individual who is prone to anger might readily think, “That inconsiderate [profanity],” whereas a person who is not prone to anger might think, “Maybe she is rushing to a sick child, or is panicky and has to get off.” Same incident, different perceptions—one type involves the perception of violation, producing anger, and the other does not, resulting in a calmer reaction. As people learn to consciously generate more alternative perceptions, anger subsides, and eventually they start to unconsciously generate nonviolation perceptions. It is not uncommon for early-life negative or traumatic experiences to contribute to ongoing perceptions of violation, and psychotherapy directed at helping the person consciously process these experiences can reduce the motivation for violation-based perceptions.

The same process applies to sadness-inducing perceptions, in which a person perceives excessive losses, and fear-inducing perceptions such that a person perceives excessive threat or danger. By altering perceptions to see less in the way of loss and threat, a person will experience less sadness and fear, respectively. It is important to not confuse emotional information processing and briefly experienced emotions with mood states or with depression and anxiety. Mood states arise when emotional reactions of a certain type persist over hours or perhaps days, such as when a person perceives a major threat and feels persistent fear. Anxiety and

depression involve amplified fear and sadness, respectively, often entailing mutually reinforcing negative thoughts and emotions (31–33). This “amplification effect” arises from the evolution of human intelligence, which has provided humans with the capacity for more intensive, extensive, and persistent thoughts, making them both more upbeat when this amplification process takes a positive form, such as with happiness and interest, but depressed or anxious when it takes a negative form, as with sadness and fear (32, 33).

Both emotional and nonemotional information processing then occur largely unconsciously and have a very logical and, hence, rational aspect. Reality congruency, often thought to be inconsistent with unconsciousness, is fostered by the rationality of unconscious information processing. It might be opined that emotions often seem irrational and dysfunctional, but these occurrences become more understandable when one considers, first, the presence of positive and negative biases and, second, the amplification effect provided by human intelligence. For instance, if a person interprets a fairly neutral comment from his or her boss in a negative fashion, fear occurs because of a bias favoring the perception of threat. Thoughts can amplify this perception of threat, such as “What if the boss wants to fire me and is trying to find reasons to let me go?” Feeling more fearful, the person generates more negative scenarios, resulting in an irrational escalation of the fear response. The irrationality arises from the negative bias and amplification effect, although the underlying emotional information processing of threat perceptions and fear is rational. The negative side of amplified emotional states sets the stage for anxiety disorders and depression (32, 33).

## **ACTION PREPAREDNESS**

An aspect of unconscious brain functioning consistent with unconscious (and also conscious) information processing is action preparedness (2, 3, 34, 35). It is often assumed that consciousness is absolutely required for volition, but evidence suggests otherwise (15). Readiness potential for action has been identified a full second before the action, whereas the conscious decision to act occurs only one-quarter second earlier (34). Libet et al. (34) had subjects freely move their index finger and report their conscious decision to move it. The conscious decision came one-quarter second before the movement, whereas neural activity associated with the event came a second before the action—three-quarters of a second before the conscious decision. Addressing potential deficiencies in the Libet et al. study, Soon et al. (35) replicated it with modifications and found that in the frontal and parietal cortex, unconscious activity occurred up to 10 seconds before performance of the given behavior.

To facilitate action preparedness, the unconscious mind appears to collect information from the environment, generate models or probability estimates of potentialities, act in relation to these models, and compare incoming information against the predictions of the models (15, 36, 37). From a

psychoanalytic perspective, the products of unconscious prediction enter consciousness in the form of dreams, narratives, and transference (38). Wishes play a major role in this unconscious predictive ability, according to Freud (39): “The wish makes use of an occasion in the present to construct, on the pattern of the past, a picture of the future” (p. 125).

Working from a more neuroscientific perspective, Gray (37) postulated a comparator system that predicts the next state of the world as perceived through the senses and compares this product with incoming data, providing match-mismatch information. Mismatch produces a predictive error (40, 41). Conscious attention is diverted to these predictive errors, at least of the negative type (37, 40). Interestingly, conscious awareness of unconscious action preparedness might provide for the feeling of *déjà vu*: people have an intuitive sense that events will unfold in a certain fashion based on an awareness of unconscious probability estimates of future potentialities, and when unconscious predictions match reality precisely, a *déjà vu* feeling might arise, giving people the false feeling that they have experienced this event previously. Consciousness awareness plays a key role in motivating adaptive responses to circumstances, such as the movement of grass indicating a predator and motivating a quick withdrawal (42). Indeed, consciousness might have evolved to optimize actualization of adaptive potentialities and diminish the actualization of maladaptive potentialities, based on the motivational value of conscious awareness (42).

In the absence of depression or anxiety, unconscious action preparedness demonstrates a positive bias, as do conscious evaluations, consistent with information processing positivity biases (31, 43–45). For example, mental health involves an optimistic bias regarding the future (31, 45, 46). Clinical depression and anxiety disorders demonstrate extensive negative distortions in unconscious and conscious information processing (31, 46, 47). These negative distortions slant action preparedness in a negative direction. In the case of depression, a higher probability is assigned to loss outcomes, and feelings of sadness or depression arise in anticipation of these outcomes. Action planning is oriented to loss. With anxiety, a higher probability of threat or danger outcomes is assigned, and feelings of fear and anxiety arise. Action preparedness emphasizes threat and danger, with avoidance frequently occurring.

Psychotherapy of various forms fosters a positive shift in information processing, thereby correcting these negative distortions (32, 48). Consequently, probability estimates of loss and threat outcomes are reduced, and probability estimates of good outcomes are increased. This process is very straightforward for cognitive-behavioral therapy (CBT), but it applies equally to other therapies (32, 48). For instance, analysts interpret unconscious material related to conflicts, which is frequently expressed in a disguised form in dreams and transference, elevating them to a conscious level where they can be revised (32, 48). Hence, with psychotherapy negative unconscious biases related to action preparedness are shifted to more positive ones. Being aware of how negative

distortions associated with anxiety and depression bias action preparedness provides psychotherapists with additional motivation to identify these distortions and help clients shift them in a more positive direction, thereby fostering more positive action preparedness.

## PSYCHOLOGICAL DEFENSE MECHANISMS

Sigmund Freud described mechanisms that defend the conscious mind from intolerable unconscious inputs (49). Vaillant later arranged specific defense mechanisms into immature, intermediate-neurotic, and mature. Immature defense mechanisms consist of defenses such as schizoid fantasy, splitting, idealization and devaluation, projection, hypochondriasis and somatization, undoing, acting out, and denial (50, 51). Intermediate-neurotic ones include intellectualization, rationalization, repression, isolation, reaction formation, and displacement (50, 51). Mature defense mechanisms consist of humor, sublimation, anticipation, altruism, and suppression (50, 51). This classification is based partly on the general adaptive value of the defense and partly on the stage of life when the defense is most likely to be expressed (50, 51). For example, acting out is common in childhood despite its limited adaptive value, whereas more mature defenses are most frequently encountered beyond childhood and adolescence. Rather than occurring in discrete clusters, defense mechanisms appear to occur on a continuum from immature to mature (52). Trijsburg et al. (52) had experienced psychoanalysts rate the maturity level of psychological defense mechanisms and applied various statistical analyses to the data, including factor analysis. They found more support for a unidimensional representation from least to most mature (52).

An inverse relationship exists between the maturity level of classical psychological defenses and the degree of cognitive distortion: The more mature the level of defense is, the less occurs in the way of cognitive distortions, and the more immature the level of defense is, the greater the cognitive distortion (33). For example, schizoid fantasy, one of the most immature defenses, involves extensive cognitive distortion such that reality congruency is compromised, whereas humor, a very mature defense, entails only an attenuation of a negative state. Bowins (32, 33) proposed that psychological defense mechanisms are largely based on two main templates, positive cognitive distortions and dissociation. Dissociation produces a detachment from negative emotional states and is arranged on a continuum from emotional numbing to absorption with or without imaginative involvement, depersonalization and derealization, amnesia, and identity fragmentation. Most of the classical psychological defense mechanisms represent positive cognitive distortions, although several have strong elements of dissociation, such as splitting, reaction formation, repression, isolation, and suppression (32, 33).

Psychological defense mechanisms, however conceived, are actually highly rational in that they provide resilience to

and adaptive compensation for emotional stress and reduce the likelihood of negative emotional states escalating to depression and anxiety disorders, likely accounting for their evolution (32, 33). It might be argued that immature defenses are not adaptive, but when expressed in childhood or the teenage years they represent the available capacity of the person at that age, and they do reduce emotional stress in the moment. For instance, a child being abused might engage in schizoid fantasy involving mystical creatures that will save him or her in order to feel hope and comfort. When expressed at a later age, immature defenses can still provide relief from emotional stress in the moment, such as when a person with borderline personality disorder splits treatment providers. However, the use of these defenses in older individuals does have a negative impact on relationships and overall functioning, and therapeutic interventions are important.

In general terms, mental health is characterized by a defensive positivity bias, or positive cognitive distortions (31, 43). Beck (31) stated that the greatest explanatory power is provided by a model stipulating that the nondepressed cognitive organization has a positive bias; as it shifts toward depression, the cognitive bias is neutralized, and as depression develops, a negative bias occurs. In effect, the illness captures the defense, with depression transforming the healthy positive defensive bias into a negative bias, much as the immune system turns against the self in autoimmune conditions (32, 33). Psychotherapy of different forms transforms the negative bias into a healthy positive bias (32). CBT, or at least the cognitive part, does so most directly by reappraising negative perspectives, but psychotherapy in general tends to help people reframe negative scenarios and generate a more positive narrative (32). In addition, psychotherapy, particularly that of a psychodynamic orientation, shifts classical defense mechanisms from immature to mature in those with borderline personality disorder, and in people with other personality disorders, for that matter (53, 54).

For the most part, psychological defenses are unconscious and are applied without conscious awareness to cope with emotional stress. A unique option in psychotherapy is to directly address defense mechanisms in sessions (55). This technique involves using therapist-client interactions, as well as interactions outside of therapy reported by the person, to identify the use of immature defenses and demonstrate how the defenses used limited outcomes—for instance, how acting out and splitting treatment providers limit progress in therapy. Mature defenses are explained, and examples are provided of how their application would have resulted in improved outcomes. Instead of acting out and splitting treatment providers, sublimating negative energy into constructive endeavors such as psychotherapy can advance personal growth. Likewise, anticipating negative outcomes and proactively managing these situations leads to positive outcomes. Role-playing can be used to enhance the person's progress in shifting from immature to mature defenses. This process is aided by how mature defense mechanisms can be consciously controlled (33). These therapeutic strategies

typically involve applying conscious awareness to largely unconscious defensive processes.

### COGNITIVE REGULATORY CONTROL PROCESSES

All biological systems rely on regulatory control over essential processes. Within one's own body, physiological parameters such as electrolyte composition, blood sugar level, temperature, and blood pressure are tightly controlled. When this regulation falters, disease occurs, as with diabetes, which involves deficient control of blood sugar levels, and hypertension, or sustained high blood pressure. Even the growth of cells is controlled by various signals to keep the system in balance.

Although biological regulation is well established, regulation over psychological states is not sufficiently appreciated (56). However, it appears to apply as much as does regulation over biological processes. For example, there is solid evidence that amygdala-based fear and anxiety responses are regulated by prefrontal cortex (PFC)-amygdala connectivity, typically ensuring that exaggerated anxiety reactions are attenuated to promote adaptive functioning (57–59). Excessive fear and anxiety involve amplified activity in limbic and paralimbic structures and decreased activity in the PFC (57–63). This pattern is typically interpreted as the PFC not exerting sufficient top-down regulation of limbic system fear and anxiety responses (57–59, 62–66). PFC-amygdala connectivity also regulates phobic reactions derived from increased amygdala activation (67). The PFC is the brain's master controller, accounting for a third of the human cortex, and uncontrollable acute and chronic stress impede normal PFC functioning, impairing regulation (64, 65). Greater PFC and reduced amygdala activation have been observed in patients with social anxiety disorder who completed CBT (57). Excessive sadness contributing to depression likely also involves impaired PFC regulation of excessive limbic system responses.

Regulation over emotional and related psychological processes occurs entirely unconsciously (68) and is highly rational; irrationality only transpires when this regulation fails and excessive negative emotional-cognitive states arise, such as fear of benign entities. Unconscious regulation also applies to defense mechanisms, in that people are not aware of what defense mechanism is selected to deal with a stressor, how long it is applied, or why its use is terminated (55). Impaired regulation over defense mechanisms is commonly seen in people with borderline personality disorder (55).

Psychological regulation and impairments to it might even extend to psychosis and mania (56, 69, 70). Regarding psychosis, the PFC and other higher cortical structures appear to block extreme cognitive distortions, thought form variants, and sensory perceptual experiences (psychosis) from the conscious and awake state to facilitate the reality congruency necessary for adaptive functioning (56, 70). During sleep, when reality congruency is not a concern, this regulation is relaxed and psychotic equivalents are expressed in dreams

(56, 70). Research evidence supports the notion of impaired cognitive regulatory control over psychotic-level cognitions, and that the PFC is a key site for these regulatory processes (71–73). During dreaming, when psychotic equivalents are expressed, there is less PFC activity (73) and the bizarreness of a dream is directly related to the degree of hypofunction of the PFC (74). Creativity has often been linked to psychotic thought capacity, and this linkage appears related to cognitive regulation, or reductions thereof, over cognitive distortions: research has revealed that the PFC is less active during creative idea generation but more active when the products of creative thought are implemented (72). Psychedelic drugs were believed to induce psychosis by increasing brain activity, but it appears that reduced cognitive control is pivotal (71). Carhart-Harris et al. (71) discovered that psilocybin, the hallucinogenic in “magic mushrooms,” reduces activity in control centers of the brain, such as the PFC, thalamus, and anterior and posterior cingulate cortices, and that the greater the reduction in activity within these control regions is, the more intense the self-reported psychedelic experiences are. Conceivably, the link between marijuana use and psychosis might work in the same way.

As pertains to mania, the real issue might be deficient regulation over hypomania, allowing it to transform into dysfunctional mania. Hypomania appears to have evolved as a defensive response designed to temporarily override or interrupt depressive inhibition in the here-and-now to restore adaptive functioning via increased physical, social, and mental activity (69). Supporting this defensive role, hypomania occurs on a one-to-one ratio with depression, translating to 3%–6% of the general population worldwide, with mania much less common at 1% (75–77). Consistent with this prevalence ratio, hypomania typically does not progress to mania (75, 78–80). If cognitive regulation over hypomania is impaired—for example, because of alcohol, medication or illicit drugs, stress, or genetic vulnerability, often acting in combination—mostly adaptive hypomania can progress to dysfunctional mania (69). Hypomania and mania are not discrete entities; they instead occur on a continuum, enhancing the possibility of this occurrence (69). Hypomania is often viewed as dysfunctional, a view facilitated by the *DSM-IV* and *DSM-5* minimum four-day criteria (81) when research has identified the modal time frame as one to three days (82–85). A substantial body of research supports the position that hypomania is typically adaptive (76, 82, 86–89, Kraepelin [1921] cited in 87). This model can also explain why mania frequently entails psychosis: If regulation over the progression of hypomania to mania is impaired, the probability is increased that regulation over psychotic-level cognitions and sensory perceptual experiences will also be impaired (56, 69, 70).

Impairments in regulation over psychological states can be addressed via psychotherapy. Cognitive-behavioral and related techniques, such as cognitive reappraisal, suppression therapy, willful detachment, and absorption in positive activities, might actually work by restoring healthy cognitive

regulatory control—cognitive regulatory control therapies—although they are not typically framed in this way (90). These techniques succeed in increasing PFC activity and reducing excessive limbic system activity, thereby diminishing excessive emotions pertaining to anxiety and depression (57, 91, 92). For example, if a person is very anxious, absorption in relaxing activities suited to the person and conscious detachment from anxiety-provoking thoughts using the relaxing absorptive foci—techniques falling under therapeutic dissociation strategies (93)—can help downregulate the excessive fear and anxiety. Likewise, reappraising circumstances to see less in the way of threat helps to enhance cognitive regulatory control.

Cognitive-behavioral and related techniques can also be used to treat psychosis. These techniques include asking the person to provide evidence for beliefs, generating alternative perspectives, and testing the various possibilities (94–96). For example, requesting evidence to support the notion that neighbors are entering a person's apartment and generating other options for missing items, such as misplacing or accidentally discarding them. All such techniques rely on the principle of normalization: Psychosis occurs on a continuum, and therapeutic strategies can normalize extreme expressions (96, 97). With motivated and self-aware individuals having psychosis, these techniques can treat delusional thinking, and the benefits are usually enhanced when combined with antipsychotic medication (90).

On the basis of assumptions that hypomania is adaptive for the most part and that hypomania and mania occur on a continuum, various cognitive regulatory control techniques, such as relaxation strategies, reduced stimulation, and withdrawal from substances that foster mania, can stop the progression from hypomania to mania (90). These techniques often have to be complemented with brief-duration antipsychotic or benzodiazepine medications, and they only work with people who are self-aware and motivated, and when there is regular and solid patient-therapist interaction (90). For a detailed discussion of cognitive regulatory control therapies, see Bowins (90). A pivotal aspect of cognitive regulatory control techniques is the application of conscious awareness to regulatory processes that are usually entirely unconscious. By consciously applying the various strategies described, regulation over the processes fostering mental health is restored, or at least advanced.

## HUMAN-SPECIFIC COGNITION

Operating at an unconscious level are various cognitive processes that characterize humans, hence the term *human-specific cognition* (56, 70, 98, 99). The term is not meant to imply characteristics entirely absent in other species or in human ancestors during evolution; traits are derived from preexisting templates on the basis of how natural selection conserves resources by building on what has come before (100). The term instead refers to the compilation of cognitive abilities that distinguish humans behaviorally from other

species. These abilities include basic cognition, social cognition, and motivational states. Basic cognition largely refers to executive functions, including working memory, initiation, inhibition, cognitive flexibility, task completion, attention, planning, organizing, and monitoring (99, 101–107). Social cognition includes how people think about themselves, others, social situations, and interactions (so-called theory-of-mind deficits), plus emotional information processing, understanding complex social-emotional scenarios such as irony and sarcasm, and social drive limitations (99, 108–113). The third form of human-specific cognition consists of various motivational states (114–116). Some of the rational unconscious processes already discussed rely on these human-specific cognitive capacities, such as information processing. These capacities also support and add to conscious experience, as with cognitive flexibility, which allows rapid shifts in conscious ideation.

When human-specific cognition fails, so-called negative symptoms transpire (56, 70, 98, 99). In addition to defects in executive functioning and social cognition, these symptoms include amotivational or absence symptoms consisting of apathy, avolition, anhedonia, alogia, motor retardation, affective flattening, poverty of speech, and absence of play and curiosity (114–116). Negative symptoms are a largely unappreciated aspect of mental illness because they are only somewhat recognized in schizophrenia when they form an integral part of this illness, and they play a pivotal role in many other mental health conditions. In schizophrenia, they are prominent but less dramatic than psychosis or positive symptoms (117, 118). It is quite likely that the disease processes involved in negative symptoms impair cognitive regulatory control over psychotic-level cognitions, resulting in psychosis (56, 70). Although bipolar disorder is not usually thought of in terms of negative symptoms, they are actually very prominent (119–124). As in the case of schizophrenia, negative symptoms likely play a role, in this instance via impaired regulation over the conversion of largely adaptive hypomania to mostly maladaptive mania, as well as psychosis with mania (56, 69, 70). Psychosis in depression also likely arises from negative symptoms associated with severe depression.

Several other conditions entail pronounced negative symptoms. Intellectual disability (formerly known as developmental delay and mental retardation) involves global deficits in basic cognition and specific forms of learning impairments, such as for math or language, result from focal deficits in basic cognition related to the nature of the impairment (117, 118). Autism spectrum disorder arises from global deficits in social cognition (117, 118). Considering the extensive nature of the impairments in social cognition in this condition and how critical this form of human-specific cognition is to success, it is not surprising that six years after leaving high school, barely 55% of people with intellectual disability or autism spectrum disorder have any employment, including volunteer or part-time work, whereas people with intellectual disability have a higher rate of employment (125).

Attention-deficit hyperactivity disorder is another condition highly linked to negative symptoms that appears to involve select deficits in basic cognition, such as attention, inhibition, set shifting, and also possibly some social cognition limitations related to emotional information processing (117, 126, 127)

Given the largely neurodevelopmental (and in the case of later-onset schizophrenia likely neurodegenerative) nature of negative symptom conditions, therapeutic interventions tend to be limited (although this is currently a hotly debated area in part because of the commercialization of therapeutic programs), with intensive efforts often producing only small gains (128–131). For example, Dickinson et al. (130) found that extensive cognitive remediation training did not produce a significant benefit on any neuropsychological or functional outcome measure. It is also well-known that intensive therapy for autism is required to produce even marginal gains, let alone significantly improve the social cognitive impairments. Contrast these outcomes with taking an antipsychotic medication to resolve psychosis. Future efforts addressing negative symptoms to preserve human-specific cognition will likely have to be directed at identifying and intervening in the neurodevelopmental phase.

From the perspective of psychotherapy, it is important to appreciate that anyone with deficits in human-specific cognition might have difficulty working with the cognitive, social, and motivational demands of treatment. If the person has impairments to executive functions, such as working memory, cognitive flexibility, and attention, he or she will have challenges processing information, such as transference interpretations or even the working hypothesis for mental illness issues. Consequently, information might have to be parsed out in smaller units and relayed in concrete terms with more examples. Language might also have to be kept very basic. Social cognitive impairments can limit a person's ability to respond appropriately to the social interaction between therapist and client and transform any social learning into constructive improvements in social interactions with others. More extensive role-playing is often required, with assistance provided in identifying emotions in facial expressions (facial expression recognition).

Regarding motivational states, a frequent frustration encountered by therapists is not seeing clients transform therapeutic interventions into behavioral advances away from therapy. Understanding how negative amotivational symptoms, even among those who do not have schizophrenia or a severe mood disorder, play a role in this outcome can reduce frustration. Targeting specific behavioral improvements, as opposed to more general motivation, can help a client progress with behaviors outside of psychotherapy. For instance, the therapist can focus on having the client engage with coworkers at lunch instead of trying to advance socialization in general. Identifying and working with negative symptoms entails conscious awareness, for both therapist and client, of the relevant human-specific cognitions and deficits that exist.

Human-specific cognition is then a set of largely unconscious processes that are crucial to mental health and that when impaired produce negative symptoms. These negative symptoms represent an underappreciated aspect of mental illness because they play a profound role in many mental health conditions while barely being recognized, other than perhaps in schizophrenia. By appreciating the importance of human-specific cognition and negative symptoms, treatment providers will advance in their understanding of mental illness. By identifying and working with impairments in human-specific cognition, a process that entails conscious awareness of negative symptoms, psychotherapists will be better equipped to assist their clients and experience less frustration.

### CASE EXAMPLE

No single or even a few cases can cover all the psychotherapeutic interventions that follow from the rational aspects of the unconscious, but I present a brief case that illustrates several strategies. Amy, a graphic designer in her early 30s, has a combination of depression and anxiety, a common comorbidity, and has experienced psychosis when severely depressed. She takes an antidepressant regularly and lorazepam as needed when her anxiety level is escalating toward the panic range. She is self-aware and conscientious about self-improvement. Regarding emotional information processing, she experiences a great deal of sadness, fear, and at times anger. In therapy, we covered the core circumstances associated with each emotion and how she largely unconsciously processes loss, threat, and at times violation. Through cognitive reappraisal, her emotional information processing has shifted to seeing less in the way of loss, threat, and violation. For example, at work a change in manager does not mean a setback, threat to job security, or violation of the stability of her role. Instead, it is an opportunity to learn new things and grow in her job. Pertaining to action preparedness, we looked at how, with her tendency to process loss, threat, and violation, her mind prepares her for negative circumstances, and she is always in alarm mode. By addressing and correcting the negative distortions, she has shifted to preparedness for potentially positive outcomes, creating a more secure feeling state.

Amy generally uses mature defenses, but when she is stressed or depressed, she tends to apply them to a lesser extent, thereby impairing her capacity to cope. We discussed the process of sublimation and how she can channel the negative energy arising from sadness and depression, fear and anxiety, and anger into constructive efforts at work and in hobby activities. She appreciates the positive energy that ensues from this shift. Regarding cognitive regulation, the negative emotions she experiences with depression, anxiety, and anger suggest that she has impaired higher cortical regulation over limbic system responses. The cognitive reappraisal strategy applied to shift emotional information processing in a more positive direction helps restore this

regulation. In addition, absorption in positive activities, assisted by sublimation, reduces anxiety by detaching her from perceived threats. Compartmentalizing work stresses from the positive aspects of her job, and also from activities away from work, is another therapeutic dissociative technique. These therapeutic dissociative techniques help Amy to reestablish cognitive regulatory control over the excessive limbic system activity associated with anxiety.

During a couple of severe depressions, Amy has become psychotic with delusions of a persecutory type, believing that coworkers are conspiring to get her fired. Although temporarily adding antipsychotic medication is the primary intervention, cognitive regulatory control techniques were applied to help resolve the psychosis. We went over how she has to show evidence that her accusations are true. As with most delusions, she could not support her claims. She was then encouraged to generate alternative reasons for the actions of others and the events used to support her delusional claims, for instance, "The reason coworkers are not inviting me to lunch is that I am being more negative and it disturbs them," not because "They want to get rid of me." These psychotherapeutic strategies normalize her thought processes and produce a fuller resolution of the psychosis.

Amy's human-specific cognitions are quite intact, but she has some social cognitive limitations that contribute to her negative emotional state. She is introverted and struggles to understand others' motives, limiting friendships and romances. We covered how to interpret the actions of others, including my own as her therapist, to bolster her social cognition. For example, if I am late starting a session, it is not because I do not want to see her, but because I am busy. We focus on improving specific relationships with each coworker, as opposed to coworkers in general. This tailored approach assists her in adjusting her approach to a given person. In sum, the eclectic strategies applied in Amy's psychotherapy bolster her rational unconscious processes, helping her to resolve and prevent mood problems and psychosis.

## CONCLUSIONS

The purpose of this article has been to show how the unconscious mind engages in many highly rational and reality-congruent processes that facilitate adaptive functioning. These rational processes include information processing, action preparedness, psychological defense mechanisms, cognitive regulatory control processes, and human-specific cognition. When these processes fail, or are impaired, various forms of mental illness transpire. By understanding this occurrence and using the strategies outlined here that involve attaining conscious awareness of largely unconscious processes, psychotherapists can substantially improve their clients' mental health. In closing, viewing unconsciousness as the realm of only more irrational activities is untenable, and it is very reasonable to describe a rational unconscious.

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