raises the potential for an action, but does not actually trigger that action. The triggering of a potentiated action is controlled by stimuli signaling the exact moment at which it becomes appropriate. There are, for example, two different stumble-preventing reflexes in the hind limb of the cat, one producing flexion of the limb, one producing extension (the exact opposite action). Both of these incompatible actions are triggered by a sudden onset tap on the dorsum of the paw (Forssberg et al. 1975), but they are not in practice both activated together. The flexor reflex is potentiated during the swing phase of each stepping cycle, while the opposing extension reflex is depotentiated. This pattern of selective potentiation and depotentiation reverses during the stance phase, when the paw is planted on the ground. The flexion reflex lifts the paw over an obstacle that would otherwise arrest its forward swing. The extension reflex thrusts the weight rapidly onto other legs, enabling the cat to lift the paw sooner when a moving object (e.g., a stone) threatens to sweep it from beneath the cat. Thus, which of the two reflexes is activated when the stimulus comes is determined by the selective potentiation and depotentiation so as to make the elicited action complement the ongoing phase of the step cycle, rather than hinder it.

At the top of the action hierarchy, the arousal of sexual motivation in a female rat through manipulation of her hormone levels potentiates the many different components of her sexual behavior (Adler 1973) and depotentiates reactions that would interfere with sexually oriented actions. For example, the hormonal state potentiates the lordosis response to a squeeze of her flanks, such as the male makes when he mounts. Her lordosis response firmly roots her to the floor and presents her genitals, facilitating penile entry. This same hormonal state depotentiates her flinch responses to painful stimuli delivered to her paws, presumably because such a reaction interferes with the male's intromission (Gordon and Soliman 1999).

5. *Origins of the Multiformedness of Behavior*

Complex units of behavior often have many different surface manifestations. For example, systems of coupled oscillators, of which the locomotory system is an example, can produce many different rhythmic sequences (in this case, different gaits, that is, sequences of stepping actions), depending on simple control parameters, such as the rate at which the stepping pacemakers are cycling (Wilson 1966). This is one reason why behavior takes on so many different forms. Reliance on coordination by selective potentiation and depotentiation within a hierarchical structure is a second major reason. It means that the actual spectrum of component actions that mediate a complex behavior like copulation vary depending on local circumstances particular to a given occasion, because different circumstances trigger different combinations of the potentiated actions.

See also: Cognitive Control (Executive Functions): Role of Prefrontal Cortex; Comparative Neuroscience; Motivation, Neural Basis of; Neural Systems and Behavior: Dynamical Systems Approaches; Neural Systems: Models of Behavioral Functions; Perception and Action; Word Meaning: Psychological Aspects

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C. R. Gallistel

Behavior Psychotherapy: Rational and Emotive

Rational emotive behavior therapy (REBT) was originated in January 1955 as a pioneering cognitive-

experiential-behavioral system of psychotherapy. It is heavily cognitive and philosophic, and specifically uncovers clients' irrational or dysfunctional beliefs and actively-directively disputes them. But it also sees people's self-defeating cognitions, emotions, and behaviors as intrinsically and holistically connected, not disparate. People disturb themselves with disordered thoughts, feelings, and actions, all of which importantly interact with each other and with the difficulties they encounter in their environment. Therefore, with emotionally and behaviorally disturbed people, REBT employs a number of thinking, feeling, and action techniques that are designed to help them change their self-defeating and socially sabotaging conduct to self-helping and socially effective ways (Ellis 1994, 1998, Ellis and Dryden 1997, Walen et al. 1992).

REBT theorizes that virtually all humans consciously and unconsciously train themselves to be to some degree neurotic; and that, with the help of an effective therapist and/or with self-help materials, they can teach themselves to lead more satisfying lives—if they choose to do so and work hard at modifying their thinking, feeling, and behaving.

1. Philosophical Background

Albert Ellis, the originator of REBT, was trained in Rogerian person-centered therapy in graduate school in clinical psychology (1942–7), found it too passive and abandoned it for psychoanalytic training and practice (1947–53). But psychoanalysis, too, he found ineffective because it was too much insight-oriented and too little action-oriented. His clients often saw how they originally became disturbed—supposedly because of their family history. But when he stayed with typical psychoanalytic methods, he failed to show them specifically how to think and act differently and to thus make themselves more functional.

So Ellis went back to philosophy, which had been his hobby since the age of 16, and reread the teachings of the ancient philosophers (especially Epicurus, Epictetus, Marcus Aurelius, and Gautama Buddha) and some of the moderns (especially Dewey, Russell, and Heidegger) and found that they were largely constructivists rather than excavationists. They held that people do not merely get upset by adverse life conditions, but instead often choose to disturb themselves about these adversities. Fortunately, a number of philosophers also said, people could choose to 'unupset' themselves about minor and major difficulties; and, if they made themselves anxious and depressed, they could reduce their dysfunctional feelings and behaviors by acquiring a core philosophy that was realistic, logical, and practical.

Following these philosophers, Ellis started to teach his clients that they had a choice of experiencing healthy negative emotions about the misfortunes they countered—such as feelings of sorrow, disappointment, and frustration; or they could choose to experience unhealthy negative reactions—such as panic, depression, rage, and self-pity. By using rational philosophy with troubled clients, he saw that when they faced adversities with self-helping attitudes they made themselves feel better and functioned more productively. But when they faced similar adversities with irrational (self-defeating) philosophies they made themselves miserable and acted ineffectively. When he convinced them that they almost always had the choice of helping or hindering themselves, even when their desires and goals were seriously blocked, they often were able to make that choice.

2. The ABCs of Rational Emotive Behavior Therapy

During the 1950s, Ellis put this constructivist theory into the now well-known ABCs of REBT. This theory states that almost all people try to remain alive and achieve basic goals (G) of being reasonably content by themselves, with other people, productively working, and enjoying recreational pursuits. When their goals are thwarted and they encounter adversities (A) they are then able to construct consequences (C)—mainly feelings and actions—that either help or hinder them satisfying these goals. They largely (though not completely) do this by choosing to follow rational, useful beliefs (B) or to follow irrational, dysfunctional beliefs. Therefore, although the adversities (A) they experience are important contributors to their emotional and behavioral consequences (C), they do not directly or solely cause these consequences. When at C, people feel and act neurotically or self-defeatingly, their irrational beliefs (B) and their experienced adversities (A) bring on their disturbed reactions. So A does not by itself lead to C. A interacts with B to produce C; or $A \times B = C$. However, people tend to be aware that C follows A, but not that B is also included in the process. They therefore think that As automatically lead to disturbed Cs—that their internal reactions are controlled by external events.

Ellis noted in his first paper on REBT, at the Annual Convention of the American Psychological Association in Chicago in August 1956, that when people feel and act disturbedly (C), they have 12 common irrational or dysfunctional beliefs (B) about the undesirable things that happen to them (A). When they change these to rational or functional beliefs (in therapy or on their own) they become significantly less disturbed. Both these hypotheses have been supported by many empirically-based studies, first by followers of REBT (Lyons and Woods 1991), and then by other cognitive behavior therapists who largely follow and have tested the ABC theory of REBT (Barlow and Craske 1994, Hollon and Beck 1994, Meichenbaum

1997). Hundreds of published studies have given much support to this theory.

After using REBT for a few years in the 1950s, Ellis came up with clinical evidence for Karen Horney's (1950) hypothesis about the 'tyranny of the shoulds.' He realized that the many irrational beliefs with which people often disturb themselves can practically always be put under three major headings, all of which include absolutistic shoulds, oughts, and musts. With these three core dysfunctional ideas, people take their strong preferences for success, approval, power, freedom and pleasure, and elevate them to dogmatic, absolutistic demands or commands.

The imperatives that frequently accompany dysfunctional feelings and behaviors seem to be: (a) 'I *absolutely must* perform well at important tasks and be approved by significant others—or else I am an inadequate person!' (b) 'Other people *absolutely must* treat me kindly, considerately, and fairly—or else they are bad individuals!' (3) 'Conditions under which I live *absolutely must* provide me with what I really want—or else my life is *horrible*, I *can't stand* it, and the world's a *rotten place*!'

These three common irrationalities lead to innumerable derivative irrational beliefs and frequently are accompanied by disturbed emotional and behavioral consequences. In fact, REBT hypothesizes that people would find it difficult to make themselves neurotic without taking one or more of their major preferences and transforming them into absolutistic demands. Individuals with severe personality disorders and psychosis also disturb themselves by turning their healthy preferences into unhealthy musturbating, but they often have other biochemical and neurological characteristics that help make them disturbed.

REBT also theorizes that the tendency to elevate healthy preferences to insistent demands, and thereby to think, feel, and act unrealistically and illogically, is innate in humans. People naturally and easily take some of their strong goals and desires and often view them as necessities. This self-defeating propensity is then exacerbated by familial and cultural upbringing, and is solidified by constant practice by those who victimize themselves with it. Therefore, especially with seriously disturbed people, psychotherapy and self-help procedures can, but often only with difficulty, change their dysfunctioning.

Many therapy techniques—such as meditation, relaxation, a close and trusting relationship with a therapist, and distraction with various absorbing activities—can be used to interrupt clients' musturbatory tendencies and help them feel better. But in order for them to get and stay better, REBT holds, they usually have to consciously realize that they are destructively escalating their healthy desires into self-sabotaging demands and then proceed to D: to actively and forcefully dispute the irrational beliefs that are involved in their disturbances. By vigorously and persistently disputing these beliefs—cognitively, emotively, and behaviorally—they can change their self-destructive shoulds and musts into flexible, realistic, and logical preferences. They thereby can make themselves significantly less disturbed.

3. Rational Emotive Behavior Therapy Techniques

To help people specifically achieve and maintain a thoroughgoing antimusturbatory basic outlook, REBT teaches them to use a number of cognitive, emotive, and behavioral methods. It helps them gain many insights into their disturbances, but emphasizes three present-oriented ones:

Insight No. 1: People are innate constructivists and by nature, teaching, and, especially, self-training they contribute to their own psychological dysfunctioning. They create as well as acquire their emotional disabilities—as the ABC theory of REBT notes.

Insight No. 2: People usually, with the 'help' and connivance of their family members, first make themselves neurotic when they are young and relatively foolish. But then they actively, though often unconsciously, work hard after their childhood and adolescence is over to habituate themselves to dysfunctional thinking, feeling, and acting. That is mainly why they remain disturbed. They continue to construct dysfunctional beliefs.

Insight No. 3: Because of their natural and acquired propensities to strongly choose major goals and values and to insist, as well as to prefer, that they must achieve them, and because they hold these self-defeating beliefs and feelings for many years, people firmly retain and often resist changing them. Therefore, there usually is no way for them to change but work and practice for a period of time. Heavy work and practice for short periods of time will help; so brief rational emotive behavior therapy can be useful (Ellis 1999). But for long-range gain, and for clients to get better rather than to feel better, they require considerable effort to make cognitive, emotive, and behavioral changes

REBT clients are usually shown how to use these three insights in the first few session of psychotherapy. Thus if they are quite depressed (at point C) about, say, being rejected (at point A) for a very desirable job, they are shown that this rejection by itself did not lead to their depression (C). Instead they mainly upset themselves with their musturbatory beliefs (B) about the adversity (A). The therapist explores the hypothesis that they probably took their desire to get accepted and elevated it into a demand—e.g.,'I *must not* be rejected! This rejection makes me an *inadequate person* who will *continually* lose out on fine jobs!' (Ellis 1998, 1999).

Second, clients are shown—using REBT Insight No. 2—that their remembering past adversities (A),

such as past rejections and failures, do not really make them depressed today (C). Again, it is largely their beliefs (B) about these adversities that now make them prone to depression.

Third, clients are shown that if they work hard and persistently at changing their dysfunctional beliefs (B), their dire needs for success and approval, and return to mere preferences, they can now minimize their depressed feelings—and, better yet, keep warding them off and rarely fall back to them in the future. REBT enables clients to make themselves less disturbed and less disturbable.

4. Multimodal Aspects of Rational Emotive Behavior Therapy

To help clients change their basic self-defeating philosophies, feelings and behaviors, REBT practitioners actively-directively teach and encourage them to use a good many cognitive, experiential, and behavioral techniques, which interact with and reinforce each other. Cognitive methods are particularly emphasized, and often include: (a) *active disputing of clients' irrational beliefs* by both the therapists and the client; (b) *rational coping self-statements* or effective philosophies of living; (c) *modeling* after people who coped well with adversities similar to, or even worse than, those of the clients; (d) *cost–benefit analyses* to reveal how some pleasurable substances and behaviors (e.g., smoking and compulsive gambling) are self-sabotaging and that some onerous tasks (e.g., getting up early to go to work) are unpleasant in the short term but beneficial in the long term; (e) *REBT cognitive homework forms* to practice the uncovering and disputing of dysfunctional beliefs; (f) *psychoeducational materials*, such as books and audiovisual cassettes, to promote self-helping behaviors; (g) *positive visualizations* to practice self-efficacious feelings and actions; (h) *reframing of adversities* so that clients can realize that they are not catastrophic and see that they sometimes have advantages; (i) *practice in resisting overgeneralized, black and white, either/or thinking*; (j) *practical and efficient problem-solving techniques*.

REBT uses many emotive-experiential methods and materials to help clients vigorously, forcefully, and affectively dispute their irrational demands and replace them with healthy preferences (Bernard and Wolfe 2000). Some of its main emotive-expressive techniques include: (a) *forceful and persistent disputing of clients' irrational beliefs*, done in vivo or on a tape recorder; (b) *experiencing a close, trusting, and collaborative relationship* with a therapist and/or therapy group; (c) *steady work at achieving unconditional other-acceptance* (*UOA*), the full acceptance of other people with their failings and misbehaviors; (d) *using visualizations or live experiences to get in touch with intense unhealthy negative* feelings—and to train oneself to feel, instead, healthy negative feelings; (e) *roleplaying difficult emotional situations* and practicing how to handle them; (f) *using REBT's shame-attacking exercises* by doing 'embarrassing' acts in public and working on not denigrating oneself when encountering disapproval; (g) e*ngaging in experiential and encounter exercises* that produce feelings of discomfort and learning how to deal with these feelings.

REBT uses many activity-oriented behavioral methods with clients, such as: (a) *exposure or in vivo desensitization* of dysfunctional phobias and compulsions; (b) *taking deliberate risks of failing at important projects* and refusing to upset oneself about failing; (c) *staying in uncomfortable situations and with disturbed feelings* until one has mastered them; (d) *reinforcing oneself to encourage self-helping behaviors* and penalizing oneself to discourage self-defeating behaviors; (e) *stimulus control* to discourage harmful addictions and compulsions; (f) *relapse prevention* to stop oneself from sliding back to harmful feelings and behaviors; (g) *skill training* to overcome inadequacies in assertion, communication, public speaking, sports, and other desired actions that one is inhibited about.

These are some of the cognitive, emotive, and behavioral techniques that are employed frequently in rational emotive behavior therapy. Many other possible methods are individually tailored and used with individual clients.

The main therapeutic procedure of REBT is to discover how clients think, feel, and act to block their own main desires and goals, and to figure out and experiment with ways of helping them get more of what they desire and less of what they abhor. As they make themselves less disturbed and dysfunctional, they are helped to actualize themselves more—that is, to provide themselves, idiosyncratically, with greater satisfactions. At the same time, clients are helped to stubbornly refuse to define their preferences as dire necessities and thereby tend to reinstitute their disturbances.

When Ellis originated it in 1955, rational emotive therapy was unique. It was followed by somewhat similar forms of cognitive behavior therapy (CBT) in the 1960s and 1970s, particularly the cognitive therapy of Beck (1976), rational behavior therapy of Maultsby (1975), cognitive behavior modification of Meichenbaum (1977), and multimodal therapy of Lazarus (1978). REBT and CBT were soon supported by numerous published studies that showed their effectiveness, with many different types of clients (Hollon and Beck 1994, Lyons and Woods 1991, McGovern and Silverman 1984, Silverman et al. 1992). Consequently, they now are widely employed throughout the Western world. Their use of multimodal methods of therapy has also encouraged the recent movement toward integration in psychotherapy and will most probably continue to do so in the future. It looks likely that rational emotive behavior therapy (REBT) and cognitive behavior therapy (CBT) will continue to thrive in the twenty-first century.

See also: Behavior Therapy: Psychological Perspectives; Cognitive Therapy; Experiential Psychotherapy; Psychological Therapies: Emotional Processing; Psychological Treatment, Effectiveness of; Psychotherapy Integration; Psychotherapy Process Research

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A. Ellis

Behavior Therapy: Psychiatric Aspects

Behavior Therapy refers to a range of treatments and techniques which are used to change an individual's maladaptive responses to specific situations. A useful definition is provided by Meyer and Chesser (1970): 'Behaviour therapy aims to modify current symptoms and focuses attention on their behavioural manifestations in terms of observable responses. The techniques used are based on a variety of learning principles. Although behaviour therapists adopt a developmental approach to the genesis of symptoms, they do not think it is always necessary to unravel their origin and subsequent development.'

In psychiatric practice, behavior therapy has been used and demonstrated to be useful in the treatment of anxiety disorders, obsessive-compulsive disorders, habit disorders, and in the modification of challenging or antisocial behaviors. Cognitive Therapy, which examines an individual's thinking patterns and aims to help the person to alter any maladaptive thoughts, can often be used effectively in conjunction with Behavior Therapy. Combination treatment has been shown to be effective in depression, panic, generalized anxiety, posttraumatic stress, and a variety of other psychiatric conditions.

Behavior Therapy works on the premise that, in psychiatric practice, maladaptive behaviors cause and exacerbate psychological distress. Such behaviors can be replaced or unlearned. Although the behaviors may be problematic and result in distress to an individual, initially they are rewarded by a consequence of the behavior. This reward or reinforcement of the behavior strengthens the link between the specific situation or stimulus and the resultant undesirable behavior. This is through Classical Conditioning. Behavior Therapy techniques alter the behavior and the reinforcing feedback of its consequences.

1. History of Behavior Therapy

Although a range of ancient and historical documents can be found which describe treatments of both children and adults with techniques which would now be described as Behavior Therapy, the treatment of anxiety disorders and neuroses was with analytical psychotherapy at the early part of the twentieth century. The prevailing view in psychiatric practice was that such disorders were due to unconscious conflicts which could take years of psychoanalysis to resolve. One of the earliest challenges to this belief was the now famous experiment of Watson and Rayner on Little Albert (Watson and Rayner 1920). Little Albert was a young child who had shown no fear of animals. In their experiment, Watson and Rayner placed the child in a room with a white rat. Any approach of the child towards the rat resulted in a loud aversive noise being made by the researchers. Thus, through this experiment in classical conditioning, the researchers developed a fear of white rats which subsequently generalized to other furry objects and animals in a matter of a few hours. The experimenters then hoped to reverse this experimentally-induced phobia by offering rewards to the boy while in the presence of a rat. Not surprisingly, however, Albert was discharged from hospital before this further research was completed.

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