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DEPRESSION, PERCEPTION AND COGNITION

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ABSTRACT

Depression is one of the leading psychiatric disorders today. A new approach known as cognitive therapy has made significant gains in treating depression by helping people change their understanding of their actions and environment. The approach is based on the assumption that it is primarily a person's thought process concerning circumstances, rather than the circumstances per se, that are central to depression. In this paper, we develop a system dynamics model that can be used to explain more fully the dynamics of the processes which lead to depression, as well as the dynamics of getting better. The model is used as a vehicle to integrate the many facets of cognitive therapy into a coherent classification of the technique. A variety of case studies are used as a basis of model development and evaluation. The model is simple enough to be understood by people who do not have formal training in system dynamics. As such, it serves as both a valuable tool for therapists practicing cognitive therapy as well as a means of communication to the general public of the nature of cognitive therapy.

INTRODUCTION

Almost everyone experiences depression to a greater of lesser degree at some point in his or her life. In fact, depression is the leading mental health problem today. In the 1960s, a relatively new theory of depression led to the development of cognitive therapy (Beck, 1967, 1976, Beck et. al. 1979). Clinical research is proving cognitive therapy superior to traditional methods in helping people who are suffering from depression. Depressed patients in cognitive therapy not only respond faster, but also tend to experience sustained relief for longer periods of time compared to patients in pharmacotherapy and other, established and accepted methods for treating depression (Rush et. al.,1977)

Cognitive Therapy is a non-drug therapy based on a structured view of the interaction between an individual's thoughts, perceptions, feelings and actions. This paper presents a brief overview of the cognitive theory of depression and develops a simulation model that captures the essence of the structured theory. The simple model of depression offers a coherent framework in which to consider the theory's assertions as to the underlying causal structure of depression, and, given those assumptions, to probe the potential impacts of different treatments. As such, therapists can use the model as a powerful communication tool as well as an aid in developing strategies for treating patients.

The model and results presented in this paper are preliminary. The model attempts to integrate the elements of the cognitive theory of depression and formalise the function of cognitive therapy in the treat-

ment of depression. It is based on theory and case studies presented in the literature.

COGNITIVE THEORY OF DEPRESSION

The cognitive theory of depression is based on the tenet that an individual's moods and emotions are ultimately dependent on how the individual thinks, hence the name "cognitive" theory. Cognition refers to how people think, their perceptions, beliefs, and the way in which they interpret the world around them. Specifically, cognitive theory asserts that cognition, or thought, determines the way in which a person perceives their environment: erroneous thought patterns and beliefs cause distortion in expectations as as well as erroneous perceptions. The distorted perceptions tend to evoke unpleasant emotions and reinforce erroneous cognitions. "Erroneous" is used in this case to label a belief or perception that has no basis in fact or is a distortion of fact. For example, if a person believes he is exceptionally clumsy, he will expect to be clumsy. His attention will tend to focus more on any incidents in which he is the least bit awkward, than on incidents in which he is graceful. His heightened and distorted perception of clumsiness evoke feelings of inadequate, or perhaps of frustration, and reconfirm his belief about being awkward. Quite possibly, upon comparison, the person may prove to be no more clumsy than the average fellow.

In essence, the cognitive theory of depression claims that cognition creates emotion and mood, and that negative emotions foster heightened awareness to negative events and result in negative perceptions and thoughts which inevitably contain distortions. Cognitive theory asserts that the key to break the unnecessary and unpleasant cycle of depression is to correct the erroneous patterns of cognition.

Compared to traditional theories of the psychology of depression, the cognitive theory is empowering. Depression is viewed as a result of a logical error which the individual is at power to correct. It is the individual that creates or resolves his depression; he is not a helpless emotional victim of his innate chemistry, his rigid personality, his hereditary, his environment or his drugs.

COGNITIVE THERAPY OF DEPRESSION

Dr. Arron.T. Beck (Beck, 1967) began to develop cognitive therapy upon the recognition that depressed people typically think about things differently than people who are not depressed. He noted that depressed individuals often put markedly different interpretations on events than do non-depressed people. Specifically, depressed patients tend to perceive activity and information around them as a negative, personal comment on themselves. Neutral and even positive events become devalued and perceived to be negative personal statements. This results in the fact that depressed people are faced continually with erroneous, negative reflections on themselves (Burns,1980).

Most people become depressed when constantly faced with negative statements about themselves. Cognitive therapy does not try to relieve depression that occurs in such a negative environment; rather, it focus on identifying the erroneous pattern of cognition that create the distorted environment and cause the depression.

The goal of cognitive therapy of depression is to help the patient identify and change any distortions in his or her patterns of cognition in order to achieve and sustain improved emotional well being. The therapy relies on the common sense reaction of a person when she learns to recognise and scrutinize her way of thinking for distortions, and begin to understand why she tends to respond the way she does; they are then in a position to change their response by eliminating their cognitive distortion. The success of the therapy depends upon the extent to which an individual can change his or her ways of thinking.

The key concept in cognitive therapy is cognitive distortion. Dr. D.E. Burns (Burns, 1980) outlines ten types of cognitive distortions common in depressed patients which cover the following basic tendencies: to bias attention to negative perceptions over positive perceptions; to discount events not conforming to expections; to over-generalize and jump to conclusions; to interpret things as negative, personal statements. The therapy helps the patient to recognise the distortions he or she uses. The careful record of events, thoughts and activities is encouraged for feedback to prove the distortions erroneous.

Cognitive distortions are often integrated into incomplete thought and internalize quickly without conscious recognition. Cognitive therapy attempts to identify what Beck refers to as Automatic Thoughts in order to scrutinize their logic for distortions. Distortions in automatic thoughts are particularly difficult to identify because they are internalized so quickly without conscious effort.

Depressed individuals tend to lack the motivation to do activities partially due to underestimating the value derived from the activity. Since they underestimate the reward from doing things, they have lower incentive to act and forego doing things which they otherwise would do if their expectations of the reward from the activity was undistorted. In the extreme, the depressed patient will spend days lying in bed for want of motivation. Commonly, the result of this tendency is increased depression due to feeling useless. In therapy, patients are asked to record their expected pleasure or displeasure from doing activities; this record is them compared with the actual pleasure or displeasure they experienced doing the activity. The feedback offers a proof of the distortions embedded in their expections.

The patient in cognitive therapy is actively involved in a process of identifying and eliminating distortions. There are three broad areas of emphasis: simple recognition of cognitions and distortions; distinction between expectations and realisation; and the critical evaluation of distorted thoughts. Examples of recognition include the use of a wrist counter to keep track of the number of automatic thoughts or positive

events that occur in a day. Examples of distinction include the comparison between the anticipated and actual degree of difficulty and satisfaction associated with different activities. Examples of evaluations include the written record of automatic thoughts and the associated rational responses to those thoughts. The actual emphasis in a therapy session varies from individual to individual, depending on his or her specific needs.

A SIMPLE MODEL OF DEPRESSION

Model Overview

We have developed a simple model of an individual which integrates the various aspects of the cognitive theory and therapy of depression. Included in the model are only the essential elements which, according to cognitive therapy, are important to maintain an individual's mental health. They include: Cognition, Cognitive Distortion, Emotion, Activity and Energy.

Currently, the model is standardized to represent an average person. In order to apply the model to a specific individual, certain elements in the model which currently have standard values would have to be customized to represent the unique qualities of that person. The unit of time used is standardized at one week; in other words, all units are measurements for a one week time period.

The model of depression, like any model, can be useful only if it is properly understood. Unfortunately, the terminology used in models can easily leave room for confusion. This is because words loosely used in everyday language, which have perhaps a slightly different meaning for different people, are used in a model to label a specific concept or element important to the problem at hand. To understand any model, it is critical to study and exclusively use when thinking about the model the meaning which the modeler attributes to each term. As a result, a model defines a common language to discuss the issue of interest, in this case depression.

The Basic Feedback Structure

The basic feedback structure of the simple model of depression is illustrated in Figure 1. Arrows with plus (+) signs indicate that the two connected elements change in like directions; Arrows with minus (-) signs indicate that the elements change in opposite directions. For example, the arrow from Energy to Activity is positive, meaning that Activity is positively related to Energy: when an individual has a lot of energy, he can engage in a lot of Activity. Conversely, when a person is low on energy, his Activity will be restricted. In both cases, the changes are in the same direction. In contrast, the arrow from Activity to Energy is negative, meaning that Energy is inversely related to Activity. Activity requires and thus drains Energy. When a person increases Activity, she must deplete her Energy. Conversely, when she does less Activity, she has more Energy available for use; the movements are in opposite directions.

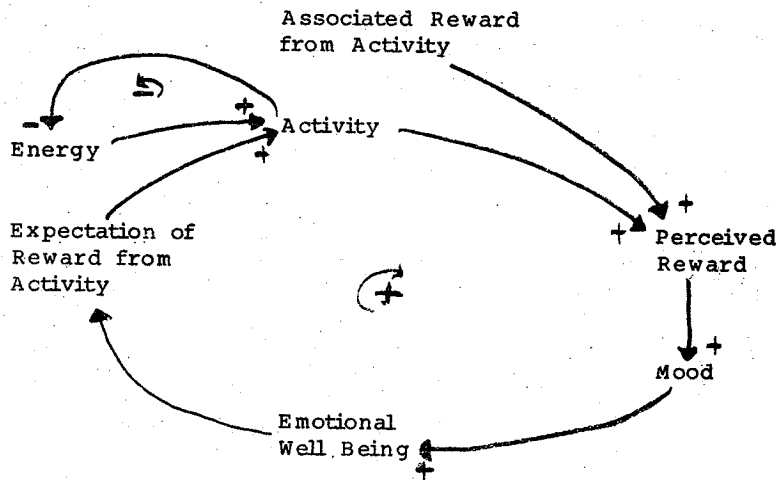

Figure 1 The model's simplified causal structure.

It is often difficult to find an appropriate point to start to describe a model. We will begin by briefly summarising the rough feedback structure, and then continue with a definition of the basic elements in the model. It may be helpful to refer to Figure 1 when reading the descriptions.

Figure 1 roughly summarise the thesis of the model, namely that cognition, determines emotions, and that combined they determing expectations. Expectations, in turn, motivate the use of energy for activity. The perceptions of the reward from the activity evoke emotions and mood. Mood effects general emotional well being.

The structure of the model can be viewed as two basic feedback loops: a positive, or accelerating, major loop, and a negative, or regulating, minor loop. The positive loop connects Emotional Well Being, Expectations, Activities and Perceptions, and enables accelerating depression or cheerfulness. For example, when a person is in a good emotional state and mood, expectations are rosy, much activity is done, rewards are reaped and the person is happy with themselves. If the person's emotional well being is a little better than at the start of the cycle, then each additional cycle will continue to enhance mental health. If at the end of the cycle, emotional well being is a little less that before, then the same cycle, becomes vicious and erodes a person's mental health into the depths of depression. The negative loop between Energy and Activity, moderates the acceleration, or gain, around the major positive loop. For example, a person enjoying a rosy cycle will keep adding activities to his agenda; however, he inevitably runs low on energy which begins to limit his activity. He adjusts his engagement in activity until he again has spare energy which, in turn, motivates him to go out and do something fun.

Cognition

In the model, the concept of cognition is divided into three distinct components: Perceptions, Expectations and Distortions. Perceptions represent the individual's recognition of his environment, including his unique perspective and ways of interpretation. Included in the term Perception is the individual's beliefs, and ideals. In short, it is a person's perception or mental picture of the world around him or her. In the model, Perceptions are measures of reward from activity and are given in units of (Warm) Fuzzies per week.

Expectations differ from Perceptions only in that Perceptions are a mental concept of what has happened in the past, where as Expectations are a mental concept of what might happen in the future. In the model, Expectations are a measure of Reward per Activity and are given in units of (Warm) Fuzzies per Step. They are used as a motivation to do activity. In a emotionally depressed state, a person's Expectation of Reward is low. As a result, the person will not chose to do much activity; he does not see it to be worth the value of the energy he would have to put into it. To some extent, an individual's expections may replicate his perceptions, but this does not necessarily have to be the case. For example, a person may have perceived numerous time last week that after she slept she was no longer tired. She may have the exact same expectation for this week. She also may have perceived tremendous pain while running in a marathon; however, in her expectations for the next marathon, she may forget about the pain and expect only the reward of reaching the goal.

The distortion component of cognition will be described later in detail.

Emotions

The concept of Emotional Well Being is used in the model as a simple, composite indicator of general emotional health. It is measured in Smiles per Week and is simply a three week average of Mood, also measured in Smiles per Week. For simplicity, Mood is a direct reflection of the perceived Reward, or (Warm) Fuzzies per Week, modified by an effect from expectation, and by the effects of comparison. For example, when a person writes a poem, he receives a certain pleasure from it. But the quality of the poem may fall short of his expectations and this might cause some disappointment. Then he may compare its quality to that of other poems he has written and may become less pleased with the poem, thinking that he really could and should have done a better job. His pleasure might be further decreased by the thought that compared to the classic poems, his poem in really bad. As a final result, he might be in a sightly depressed mood.

In practice, Emotional Well Being and Mood are commonly the elements which most readily receive the patients attention and are most commonly communicated. The measure of Emotional Well Being is intended to incorporate the essence of Dr. A.T. Beck's Depression Inventory (Beck, 1967). The inventory captures the many symptoms of depression;

though the model does not have the fine detail to represent the various symptoms, it does represent the main concept.

Activities

Two different types of activity are defined in the model: Externally Motivated Activity and Self Motivated Activity. The difference between the two is admittedly fine. Externally Motivated Activity is that which one needs to do for physical existence. Eating a healthful diet and pursuing basic hygiene would be examples of Externally motivated activity. Work, in so far as it supplies resources for basic necessities, is also an example. Some people take good care of themselves, others are perfectly content in a state of slight neglect; the extent to which an person fulfills his or her basic needs under conditions of normal mental health varies from individual to individual and can be adjusted in the model.

Self Motivated Activity, on the other hand, is activity engaged in for pleasure. Climbing Mount Everest and luxurious dining would be examples of Self Motivated Activities in so far as they exceed the basic needs for exercise and nutrition. Standard values for the amount of both activities for an average person in good mental health have be chosen for the current version of the model. Both types of activities are measured in Steps per Week and have an associated Reward per Step.

In the model, Reward from an Activity is measured in (Warm) Fuzzies per Step. It represents a general unit of measure for the value or pleasure a person derives from engaging in any activity relative to the effort invested. In other words, it is the motivating force symbolising what a individual "gets out of doing something". Naturally, the magnitude of the reward from various activities is specific to the preferences of the individual. Some people place a high value on climbing Mount Everest, other people would prefer to let such an opportunity pass. In the model, it is the relative difference in the rewards for the two types of activities that is of consequence. By definition, Self Motivated Activity is standardized with an associated Reward per Step which is twice that of Externally Motivated Activity. This is based on supposition that Externally Motivated Activity is done more out of necessity than for pleasure.

Expectations of Reward per Self Motivated Activity can be distorted perceptions; it is assumed that the Reward per Externally Motivated Activity is clearer to define and less likely to be a distortion of past perceptions. For example, the reward from eating when hungry is immediate and easier to judge than the reward from writing a book. Distortion will be discuss later.

Energy

At any time, a person has a certain storage of Energy. In the model, the term Energy represents the physical limitations on the individual. To do any activity requires the Expenditure of Energy, and without Energy, no activity can be done. The person represented in the model has a natural ability to replenish energy; it is affected by the person's

Emotional Well Being, and by the person's satisfaction of basic needs. For example, a depressed person, or a person who is getting insufficient sleep will have a weaked ability to replenish their energy. Relatively low Energy compared to normal inhibits both types of activity, though the influence on Self Motivated Activities is more severe. At extremely low levels of Energy, both Self Motivated Activities and Externally Motivated Activities are harshly restricted. This would correspond to a depth of depression that prevents and individual from caring for his basic needs. Energy is measured in Steps, and under normal, standard conditions, there is twice as much Energy available than is exerted.

Cognitive Distortion

The notion of cognitive distortion is central to the cognitive theory of depression and hence to the model. Figure 2 indicates where in the model distortion can occur (Please refer to Figure 2). Cognitive distortion pertains solely to a qualitative change in cognition. In the model Distortion can directly effect only the portion which represents the individual's cognitive structure. Expectations, Perceptions and Beliefs can be distorted; Energy, Actual Activity and Actual Reward per Activity are not cognitive elements and can not be distorted. Two basic types of distortion can occur in the model: Bias and Exaggeration. The model identifies six places in the cognitive structure where distortion can directly effect cognition. Distortion indirectly effects cognition in to places.

Bias, the first type of distortion, can potentially occur at two places in the model. It effects the process of cognition by adding or discounting an error. Depending on Mood, there is a Bias on Expected Reward per Self Motivated Activities and on Perceived Reward from Activities. Consider, for example, a person who is in a sour mood. In the model, this would appear as a low ratio between the person's Mood and their normal level of Emotional Well Being. As a direct effect of the person's bad mood, she might be pessimistic about her prospects for the day, and if her bad mood persists, she might be very difficult to please. In the model, her bad Mood will create a discounted Expected Reward per Self Motivated Activity. Otherwise good expectations will seem a little worse; otherwise poor expectations will seem a little worse. The worse her Mood, the more she will discount her expectations. The same effects works on perceptions. Conversely, if she is in an exceptionally good mood compared to her normal emotional state, she will be an optimist, expecting and perceiving everything a little better than she would have otherwise. Both Biases are dependent on Mood and thus reflects the fact that a person can be in a state of normal emotional well being and still temporarily distort reality.

The second type of distortion effects cognition by Exaggeration. It potentially occurs at four places in the model. This kind of distortion effectively exaggerates the negative and minimizes the positive under condition of depression. Consider, for example, a person who is depressed. In the model, depression is indicated as a low ratio of the individual's Emotional Well Being relative to the his normal level of Emotional Well Being. His depression, independent from his Mood, will cause

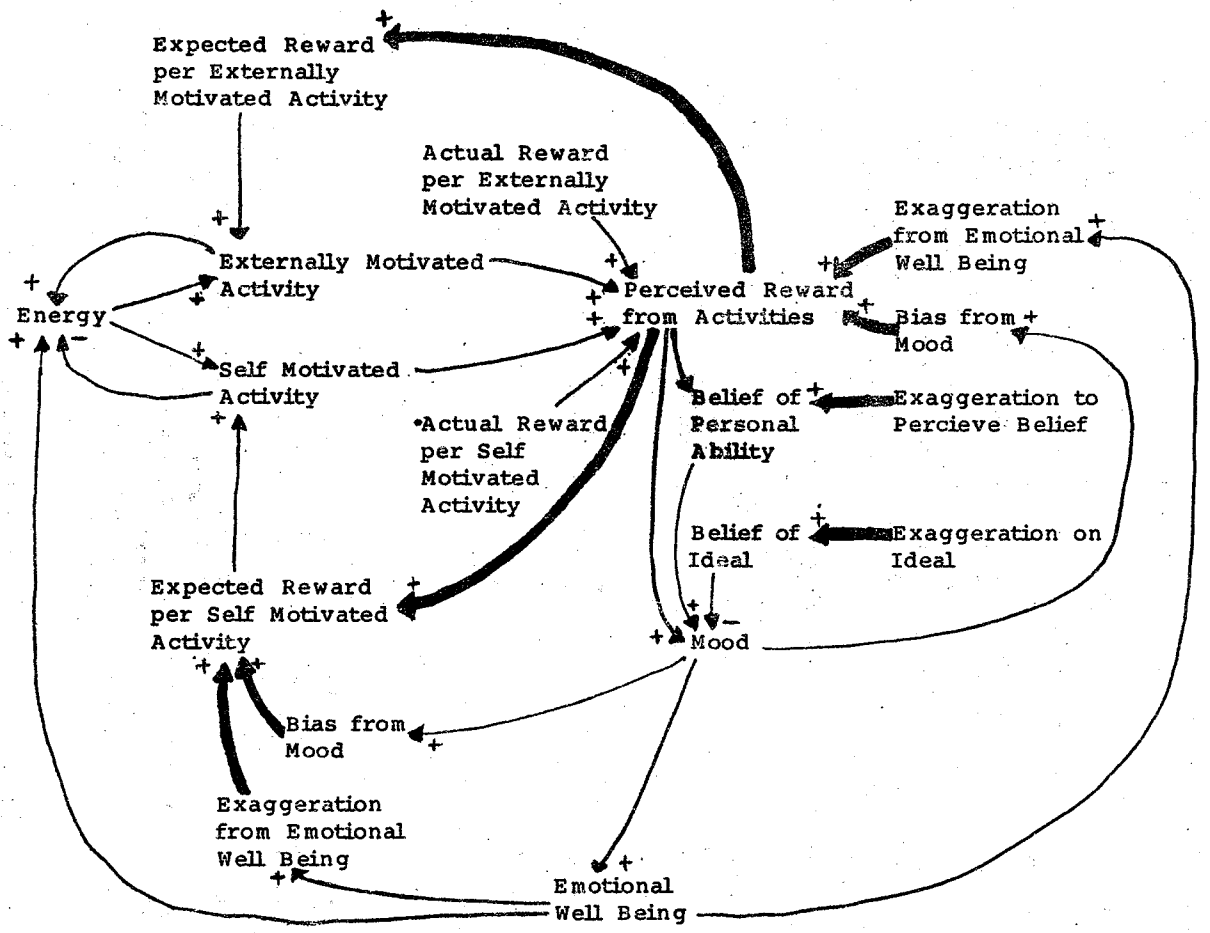

Figure 2 The model's simplified causal stucture with cognitive distortion.

him to be somewhat pessimistic in both his Expectations and his Perceptions of his environment. If, for example, his Actual Reward from Activity was low, he will perceive it as still lower. If his Actual Reward was high, he will perceive only a fraction of it. The worse his depression, the smaller the fraction he will perceive of the total Actual Reward. Conversely, as Emotional Well Being rises above normal,

The Exaggeration from Emotional Well Being also effects the two beliefs which are specified in the model. The Belief of Personal Ability simply reflects the beliefs a person acquires over time based on their experiences. For example, when a person consistently perceives that he is good at writing, he begins to develop the perception that he is a good writer. This is represented in the model as Belief of Personal Ability being an average over time of Perceived Reward from Activities. Exaggeration from Emotional Well Being can effect the determination of Belief of Personal Ability: This reflects the evidence that a depressed individual is less likely to raise their Beliefs than they are to lower them.

Belief in Ideal reflects a non-personal Ideal of how the individual should be. In reality, the determination of ideals is complex and not of major consequence to the dynamics of depression; however, there is substantial evidence (Burns, 1980) that depressed people commonly compare themselves to irrational ideals. In the model, Belief in Ideal is defined as the Actual Reward from Normal Activity, modified by an Exaggeration from Emotional Well Being. When a person is depressed, they exaggerate their ideal of what their ability to get reward from activities should be. Even if a person perceives that he has done something well, upon comparison to his exaggerated ideal, he looks bad and should have done better.

Distortion indirectly affects both expections of External and Self Motivated Activity in so far as the Expectations are based on distorted Perceptions of the Reward from Activities.

MODEL BEHAVIOR

The model is initialized to have an equilibrium with Emotional Well Being and Externally Motivated Activity standardized at normal levels. Energy is initialized to maintain the equilibrium. The values were arbitrarily chosen to represent "normal" emotional health and thus offer a standard for the purpose of comparison. By definition, at normal levels of Emotional Well Being and Mood, no cognitive distortions exist. Perceptions, Beliefs and Expectations are accurate. The basic structure shown in Figure 1 summarizes the effective elements in the model's initial equilibrium. If started in equilibrium, the model will continue in equilibrium, though for most parameter values the equilibrium will not be stable.

If the model is initialized so that the person is slightly depressed, the person will slowly bounce back to normal Emotional Well Being. The process of recovery is as follows (please refer to Figure 2): depression effects immediate distortion on expectation. The distortion exaggerates the difficulty and understates the potential benefit of a given activity;

consequently, activities that would be rewarding are not undertaken. Self Motivated Activities are restricted, and Externally Motivated Activities fall slightly. As a direct result, Energy is conserved, and the total Reward from Activity drops. After a slight perception delay, an even lower reward is perceived due to distortion, and it evokes a drop in Mood. The drop in Mood, nevertheless, is not as low as the initial depression and thus effects a rise in Emotional Well Being. Energy recovery is slightly hindered due to the initial lower Emotional Well Being; the restricting effect of slightly lower Externally Motivated Events is negligible. However, the Energy conservation exceeds reduced replenishment, and as the total Energy rises, the Expected Reward per Self Motivated Activity rises. More activities are done, and the Perceived Reward rises, raising Mood and Emotional Well Being. Eventually, as Activity is resumed, Energy expenditures exceeds replenishments and limits the growth cycle of Activity and Emotional Well Being, and the initial equilibrium is attained.

Suppose the person represented in the model receives an emotional blow which puts him in a depressed mood. It effects a sharp rise in distortion, reflected in Bias from Mood, and which begins to erode Emotional Well Being. Decreased Expectation of Reward per Self Motivated Activity limits Activities reflected in decreased Perceived Rewards. Decreased Perceptions define a quality of Mood which, depending on the magnitude of the changes, is even lower than before and further erodes Emotional Well Being. If the effects of depression are sufficiently strong, low Emotional Well Being and Decreased Externally Motivated Activity inhibits Energy replenishment faster than curtailed Activity conserves Energy. It results in a spiralling down of the level of Energy until low Externally Motivated Activity further restricts Energy replenishment. Lack of Energy eventually curtails Activity so that the little energy that is still expended, primarily for Externally Motivated Activities, is replenished. The person represented in the model settles into an equilibrium where his Energy level in very low. Pessimistic and not motivated, he neglects his primary care and does not engage in activity which brings him pleasure. His mood is foul and his depression deep. In the extreme, Energy, Activity and Emotional Well Being can be so low as to effectively correspond to suicide.

THERAPY OPTIONS

We have referred to three broad areas of emphasis in cognitive therapy: recognition of cognition and distortion, distinction between expectations and realisations and critical evaluation for distortion. The use of cognitive therapy techniques to remove cognitive distortion can be reflected at various places in the model. The use of the techniques fosters recovery of the depressed individual described in the previous summary of the model behavior. Removal of all distortion enables a quick recovery; limited success or application of therapy enables only a slow and partial recovery.

The effect of recognition of automatic thoughts in therapy can be captured in the model by altering the distortion of exaggeration from Emo-

tional Well Being on expectations and on perceptions. In the model, if therapy enables the patient to recognise and eliminate 20 percent of his automatic thoughts, the lowered distortion initiates partial recovery but the patient remains at below normal Emotional Well Being. This is due to the fact that the remaining distortion is strong enough to hold the patient in a state of low energy and depression.

The effect of distinction can be reflected in the model by modifying the distortion affecting expectations of rewards. Again, a 20 percent success in the patients ability to recognize his distortion on expectations alone will foster partial but not complete recovery; however the combined effect is enough to spark a slow, but complete recovery. The effect of critical evaluation can be reflected by modifying the bias from Mood, the distortion on Belief and the Distortion on Ideal.

The important insight is that system by virtue of its structure has the ability to recover from depression if the facters that erode energy do not overpower those which replenish it. In heathly equilibrium, distortion does not exist; as depression grows, distortion rises and has to increasingly powerful effect to drain the system of Energy, Activity and Emotional Well Being - precisely that which is needed for recovery. Distortion effectively becomes a leech on the person. The distortions that build during a onset of depression, once lessened enough for the person's inherent energy to build, become mastered by the person as he or she recovers. Cognitive therapy's success at helping the patient remove distortions effectively treats the cause of the process of depression.

EXTENSIONS

The model we have developed is a preliminary and aggregated representation of the process of depression. More attention needs to be given to the finer structure of the characteristics of depression. Specifically, the influence of suicidal tendencies are prevalent and important in the formal treatment of depression, and their dynamics needs further exploration. Functionally, therapists treat patients with suicidal tendencies differently from those without. The reasons therefor are obvious, but the question remains whether the distinction is important to the modeling of depression.

Self esteem and self confidence have not been incorporated explicitly into the model, yet it is clear that they are fundamental to depression. We have lumped these concepts into Emotional Well Being. However, emotional well being does not capture all the subtlety of self esteem and self confidence. The issue of internalization or personalization: Persons with low self esteem tend to see negative events as reflections on themselves. In the model, we have captured this through cognitive distortion on beliefs, yet this does not capture the patient's selective consideration of events as reflections on the individual. The model in its present form does not consider the impact of confidence of the individual's quality of interaction and subsequent rewards therefrom. It is clear that confidence effects the person's quality of activity, but again,

it is unclear if the effect is of critical to the structure of depression.

In the model, the planning process of the individual is not explicit. Individuals do, or do not, engage in activities because the activities are expected to be of some value relative to the effort required. In the model, this has been incorporated under the concepts of Energy and Reward Expectation. Cognitive therapy is concerned with helping people realistically evaluate these costs and benefits. Ultimately, the balance stuck between reward and effort determines the individual's experiences. The detailed structure of the planning process and its impact on the cognitive structure of depression warrants further study.

CONCLUSIONS

The cognitive theory and therapy of depression has made significant gains in the understanding and treatment of depression. The simple model developed in this paper captures the essence of the cognitive theory of depression. It offers a coherent framework with which to communicate and explore the assumptions and claims of the theory and evidence from practice. Further, it serves as a powerful communication medium for therapists as well as a structured tool to aid in the development of strategies for treating patients

The model captures the cognitive theory view of depression as a symptom, or behavior over time, of an underlying problem in the structure of thought. It shows depression as a process that holds an individual in a state of relatively low energy, inactivity and pessimism compared to that which is normal for that individual. The model illustrate how people who are normally cheerful as well as those who are normally morose can fall into the depression. In the model, the individual's depression is created internally, or "endogenously", as a result of cognitive distortions, rather than as a result of an outside force, such as a depressant drug.

The cognitive therapy processes applied in the model confirm the inherent consistency of the theory and offer further evidence for its support.

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1 The term Warm Fuzzies is originally from an American, well-loved short story by an unknown author.