

Developmental behavior analytic therapy: Easier done than said

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ABSTRACT

Developmental Behavior Analytic Therapy (DBAT) is the first behavioral therapy with developmental underpinnings. This paper introduces DBAT by presenting a composite case study. It also discusses the theoretical underpinnings of this therapy. DBAT aims to help individuals with behavioral problems change specific problem behaviors that consequently help them to lead more satisfying lives. It aims to alter specific behavioral problems, because the biological susceptibility to such behavioral problems is a given. It is suggested that this therapy be used as an adjunct to conventional therapies that specialize in helping individuals cope with behavioral problems. DBAT is different from other contemporary or behavioral analytic therapies, as it integrates a behavioral developmental stage model, the Model of Hierarchical Complexity (MHC), into its working. The foundation of this therapy is the theory that behavioral developmental stages and value of consequences of a behavior interact to predict an individual's behavior, and also suggests that behavioral problems affect both behavioral developmental stage and value of consequences.

KEYWORDS: behavioral development, therapy, individualization of behavioral requirements within task sequence, reinforcement, action, behavioral disorders, value of consequences and its discounts, model of hierarchical complexity

J WAS A 22 YEAR old research assistant, who had recently graduated from college with an above average grade point average (GPA). While he was in college, he did not assume ownership of his work. He did his assignments for classes, because he was required to do them, and not because he chose to do them to advance his professional aims. One might say that he lacked motivation on the surface. Below the surface, he seemed to lack dreams and goals. Following graduation, he took a year off and worked as a research assistant, more as a default position than to advance his career. To him, it was the most interesting job he could find. He also considered that it might improve his chances of getting into graduate school if that was what he decided to do in future. When he started work, he did not understand that work and school are different realms. In the beginning, he was disinterested and was working in a perfunctory manner. He wanted to attend graduate school, but he was unsure in what field. He was vague about his long term career goals. He thought he might want to do

research in human development. However, he had no knowledge regarding the skills and qualities required to be a researcher, nor was he aware of the processes involved. He was unaware of his career choices. Consequently, he did not know the path to attain his career goals. His work habits were poor, and he lacked research experience. His productivity was very low. Moreover, he did not have a clear sense of a time frame to accomplish his goals. His work goals were not being prioritized. He was very risk averse. He doubted his abilities, and was not confident that he could get into a graduate school. He avoided activities such as studying for the Graduate Record Examination (GRE), presenting and publishing—all of which would have helped him move towards achieving his goals. He knew very little about the politics involved in academia, as he seemed oblivious to the political nature of the world. He did not think about social relationships in a very mature way. He was able to take the perspective of others, yet often failed to see the interconnections between different variables. He thought that doing just what was required in everything was enough. He did not realize that such behavior might interfere in achieving his goals by keeping him from going further in his education. He was not aware of the political intricacies that exist among people, culture, and academia. He could not comprehend that the path to his goal would not be linear. Thus, he tended to obsess and fret (realistically) about his prospects for success.

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Many conventional therapies might focus on J's emotional reactions as the basis of his uncertainty about his future and lack of motivation. For example, psychodynamic therapy might help him become conscious of repressed conflicts and emotional reactions involved that were inhibiting his capacity to work (Corsini & Wedding 2008). A psychodynamic psychotherapist would help the patient become aware of unresolved conflicts as an explanation for his current difficulties, assuming that the nature of conflict is repeated in the repetition compulsion. What J could not recall, he was repeating. For example, consider a situation in which J had an unconscious conviction that attending graduate school or attaining success in any other arena would most certainly result in his complete humiliation and demise, perhaps even annihilation. Then the basis of his hesitation, that is work inhibition, would become knowable and interpretable. The treatment would assist J—by helping him to make repressed conflicts regarding losses and traumas conscious; and further to help him realize the role of such conflicts in his current difficulties. In this way psychodynamic psychotherapies would help J develop insight about his work inhibition (Corsini & Wedding, 2008). However, merely developing insight about work inhibition is not enough to bring about behavioral change.

Besides intrapsychic insight as the one explained above, there may be another insight essential to behavioral change, which is the insight about what causes other individuals to respond to the patient in a characteristic way. Psychodynamic therapy does not address this different level of insight. Most individuals with behavioral problems tend to lack insight into other people's behaviors towards them (Kegan, 1982). The lack of insight is understood in terms of social perspective taking resulting in a lack of intimate relationships (Commons & Rodriguez, 1990). In the case study presented above, it is important to take into consideration that J's problems were not simply associated with his emotional reactions or lack of intrapsychic insight into his own behavior. His problems were also due to inaction. When he did act, his actions failed to meet the task requirements necessary to obtain reinforcement in the present. An example of inaction would be J's tendency to avoid actions that would move him closer to getting into graduate school. He refused to study for the GRE. He did not present papers, nor publish. Part of overcoming his problem of inaction is he learns that he has a problem. J would need behavioral interventions that would help him move towards a career path and acquire knowledge and skills necessary to do so. Psychodynamic therapies, however, do not typically include behavioral interventions.

Cognitive Behavior Therapy (CBT), its myriad of variations, is a behaviorally oriented therapy. CBT includes a range of behavioral methods, such as self-monitoring, behavioral activation, behavioral experiments, exposure therapy, and skills training (Farmer & Chapman, 2007). Although CBT includes behavioral interventions, it is more focused on altering one's maladaptive thoughts. Cognitive behavior therapists hold that altering one's maladaptive thoughts will consequently change maladaptive emotional responses and behaviors as well (Lambert, Berg & Garfield, 2004). The behavioral interventions included in CBT, however do not address two crucial aspects of individuals that are important in changing a problematic behavior: their developmental stage and their valuation of outcome of a behavior, i.e. their assessment of pleasure versus displeasure.

Psychoanalysis and CBT are not the only therapies that do not incorporate developmental stage into their working. Dialectical Behavior Therapy (DBT) is an expansion and extension of CBT. It does include valuation of outcome of a behavior as it uses contingency management to change behavior (Linehan, 1987). However, the therapy does not incorporate developmental stage. Acceptance and Commitment Therapy takes the overall value of an individual's interests into consideration. It does so by clarifying what is important to the way one desires to live life (Springer, 2012). Unlike CBT, ACT does not aim to change an individual's negative thoughts. Instead, it helps individuals accept their inner states and thoughts as they are from a neutral perspective (Springer, 2012). It looks at the development of social perspective taking. But it does not consider what developmental stage one is performing at on specific tasks.

Most contemporary behavior therapies also do not directly examine the developmental sequence of operants to help individuals perform the behavior with which they are struggling. They are more geared towards extinguishing anxiety and fear from past punishments. They use techniques such as *desensitization* and *extinguishing* to help individuals overcome fear, anxiety or aversion of stimuli that hinder an individual from performing a certain behavior (Head & Gross, 2009; Mystkowski & Mineka, 2007).

Basseches and Mascolo (2012) suggested that all successful therapies promote developmental changes in forms of acting, thinking and feeling in order to produce adaptive changes. They point out the importance of developmental change that takes place in successful psychotherapy. However, there has been no behavioral based therapies that incorporate a developmental stage model into its most of its working.

It is important to understand how developmental stage affects one's behavior. From a developmental perspective, J's behavioral developmental stage contributed to his lack of understanding the nuances of relationships with other people, for example political relationships among people, culture and the environment. This prevented him from successfully pursuing his career goals. In order for J to understand these relationships better, J would need to be able to move towards a higher behavioral developmental stage. Because the reinforcement J would get from taking the necessary steps to achieve his goal was not an immediate one, the value of the reinforcement he would get from those desirable behaviors was not very high. This kept him from engaging in such behaviors. How developmental stage and value of outcome of a behavior affect behaviors of individuals will be discussed in detail in the following sections of this paper.

Unlike other contemporary and behavioral analytic therapies, Developmental Behavior Analytic Therapy (DBAT) was developed incorporating behavioral developmental stages and value of reinforcement of a behavior. DBAT is the first behavioral therapy that incorporates a developmental behavior model, the Model of Hierarchical Complexity (MHC). It aims to change problematic behaviors by helping individuals to raise their behavioral developmental stage in those particular problem behaviors and to alter their values of reinforcement of the desired behaviors. Whereas DBAT may be effective in treating behavioral problems, it does not claim to alter an individual's biological susceptibility to be-

havioral problems; it simply aims to help an individual change certain problem behaviors. We suggest that this therapy be used as an adjunct to conventional therapies, because this therapy only focuses on certain problematic behaviors. If one of J's problem behaviors was not getting things together for graduate school applications because of his anxiety associated with it, DBAT would help him change that specific problem behavior. DBAT would not directly focus on reducing the anxiety he experienced in applying to graduate school nor will it work on reducing his general anxiety on other activities. While J undergoes DBAT to change a certain problem behavior, he could also undergo relaxation therapy or other CBT aimed at helping him deal with particular behavioral problems related to GAD. Thus, this therapy may be an effective adjunct therapy. In the following sections of this paper, the authors discuss the theoretical underpinnings of DBAT and present how DBAT would analyze J's problem behaviors.

» THEORY BEHIND DEVELOPMENTAL BEHAVIOR ANALYTIC THERAPY

The core foundation of this therapy is our theory that behavioral developmental stages and valuation of consequences of behavior interact functionally to predict an individual's behavior, and that behavioral problems affect both *stage* and *value of consequences* including how it is discounted. We explain these relationships in this section. Action can be understood from the perspective of behavioral developmental stage and value. To understand the development and framework of the concept of this therapy, it is important to understand the Model of Hierarchical Complexity on one hand and valuation of reinforcement of outcomes on the other hand. The interaction between these two variables and how they are affected by behavioral problems are crucial to outcome behavior.

Model of Hierarchical Complexity

The Model of Hierarchical Complexity (MHC) is a measurement theory that analyzes the developmental difficulty of tasks represented by the *Orders of Hierarchical Complexity*. It represents the behavioral developmental stages at which an individual is performing while completing a task (Commons & Pekker, 2008; Commons & Richards, 2002A, 2002B; Commons, Trudeau, Stein, Richards & Krause, 1998). Commons, Gane-McCalla, Barker and Li (in press) formally described the model explaining its operations and axioms. Commons et al. (in press) also gave empirical and mathematical confirmation that the stages of development in MHC have gaps and that they are equally spaced. A scoring manual for MHC was developed by Commons, Miller, Goodheart and Danaher-Gilpin (2005). The MHC has also been broadly applied to many domains such as social perspective taking (Commons & Rodriguez, 1990, 1993), informed consent (Commons et al., 2006), political development (Sonnert & Commons, 1994), nature of good work (Armon, 1993), good education (Dawson, 1998), views of the "good life" (Armon, 1985; Dawson, 2000), epistemology (Kitchener & Fischer, 1990; Kitchener & King, 1990), moral judgment (Armon & Dawson, 1997), balance beam and pendulum tasks (Commons et al. 2008), hominid empathy (Commons & Wolfsont, 2002).

Order of Hierarchical Complexity characterizes the underlying difficulty of tasks. The successful completion of a task at a certain Order of Hierarchical Complexity indicates the individual is performing at the stage that has the same number and name as that Order of Complexity (Commons et al., 2008, Commons et al., 2002). The higher the Order of Hierarchical Complexity, the greater the difficulty of the task. Table 1 presents the 16 Orders of Hierarchical Complexity, their examples and descriptions.

The core of the model is task analysis. The higher-order task *coordinates* the tasks of the *next lower* order. There are three conditions that need to be met for this: *a)* higher-order task is defined in terms of two or more tasks at the next lower order of Hierarchical Complexity; *b)* higher-order tasks organize the less complex actions; that is, the more complex action specifies the way in which the less complex actions combine; and *c)* the lower order tasks have to be carried out *non-arbitrarily*, not just put together as an arbitrary chain (Commons & Pekker, 2008). For example, to be able to say or learn words, one has to have learned communication through gestures and reading gestures and emotions of others. Otherwise, one gets parroting that misses the emotions and gesture. This is often seen in people with mid functioning autism, who repeat words or phrases from commercials. One also has to first learn phonemes and then morphemes associated with those words. This is carried out non-arbitrarily as one has to first learn phonemes and then morphemes and not the other way around.

This model is significant to behavioral change because behavior of a person is affected by the stage at which a person performs. Stages are domain specific. Consequently, a person's stage of performance may vary among domains. For example, one may perform at stage 12 at work, but may perform at stage 9 when it comes maintaining one's relationship with a spouse. Behaviors that are problematic are usually a result of performance at a lower stage than required in that particular behavior. Performance at a higher stage usually results in more satisfying behavior. The current paper incorporates the MHC and the effect of stage on behavior into the workings of DBAT. The success of this therapy is dependent on the developmental behavior analyst's (DBA) ability to identify and raise the behavioral developmental stage at which the advisee functions when engaging in the behavior of interest.

Value and its discounting

In addition to behavioral developmental stage, the success of DBAT also depends on whether DBAs are able to help individuals adjust their values of outcome behaviors to achieve the desired target behavior. Commons, Ross and Bresette (2011) theorized that besides stage, value of an outcome behavior is the other variable that influences behavior. There are four forms of valuing and its discounts (Commons, Grotzer, & Davidson, in press, Commons et al., 2013).

a) First, is the value of the reinforcing consequence of behavior. It is measured by sensitivity to that reinforcement. Sensitivity to reinforcement of a behavior can be measured by presenting choices of reinforcement to people and having them rate the value of the reinforcements. The different sensitivities are most likely due to an interaction between genes and environment. Some of these differences appear on interest assessment (Campbell, 1974; Strong,

Table 1. Orders of Hierarchical Complexity, its description and examples

Order	Name	Description	Examples (verbal/physics)
0	Calculatory	Machines can do simple arithmetic on 0s and 1s.	All the software is programmed in by programmers, and the designers of the programs.
1	Sensory & motor actions	Infants may see or touch shapes, make generalized discriminations, as well as babbling vocalizations.	Either seeing circles, squares, etc. or instead, touching them.
2	Circular sensory-motor actions	Reaching and grasping object they see. These actions generate simple gestures.	Reaching and grasping a circle or square.
3	Sensory-motor	The actions become associated with vocalizations. Concepts of shape and color built out of reaching for object they see with common properties.	An infant may hold up an object and make sounds while doing so.
4	Nominal	First single words are formed as representations of concepts.	Words such as “cup” or “water” relate concepts to others. The word “one” may be said
5	Sentential	Toddlers form short sentences and phrases. The use of pronouns develops, and a few numbers and letters are said in order as well.	Sentences might be “want water,” “cup of water,” etc., responding differently to “hit ball and “ball hit”
6	Pre-operational	Sentences formed at stage 5 (Sentential stage) are organized into paragraph long utterances. Counting of objects in a line but with failure to stop when the last object has been given a number.	Tell parts of stories made out of sentences. These can be real or fanciful.
7	Primary	Paragraph long utterances are organized into stories which may be matched to reality.	Can follow orders told to them in story form. Can carry out a relatively long sequence of actions told to them to carry out. Counts accurately to large numbers
8	Concrete	Two primary stage operations may be coordinated. Counting, adding and multiplying allow for long multiplication and long division.	Children think that a deal is fair after looking at from the perspective of simple outcomes for each person who is entering the deal. Negotiations make sense but there are not social norms for setting prices or values.
9	Abstract	Variables, stereotypes, personalities, traits, etc. are introduced. The dimensionalized qualities may be used to express preferences. Calculate price when the formula only has to have the values of the variable filled in.	Quantification words like “everyone in my group,” “What would other’s think?” appear.
10	Formal	Discussions are logical and empirical support is logically brought. Solves univariate equations.	Words like “if . . .then,” “in every case, it turned out the same,” “the reasons were” occur.
11	Systematic	The new concepts are referred to as 3rd order abstractions. These coordinate elements of abstract systems.	Words like bureaucratic, capitalist, functional, and structural are common. The systematic stage concept, structure, for example, can be employed to ask whether the structure of camp helps instill the qualities we want in future citizens. The logical structure of this stage coordinates multiple aspects of two or more abstractions, as in: “relationships are built on trust and though we cannot always keep them, making promises is one way we build trust, so it is generally better to make promises than not to make them.” Here, the importance of trust to relationships, building trust, and the possibility that promises can be broken, are all taken into account while formulating the conclusion that promises are desirable.
12	Metasystematic	The new concepts are referred to as 1st order principles. These coordinate formal systems.	Words like autonomy, parallelism, heteronomy, and proportionality are common. The metasystematic stage concept of parallelism, for example, can be employed to compare the structures of the military and of camp as institutions. The logical structure of this stage identifies one aspect of a principle or an axiom that coordinates several systems, as in: “contracts and promises are articulations of a unique human quality, mutual trust, which coordinates human relations.” Here, contracts and promises are seen as the instantiation of a broader principle coordinating human interactions.
13	Paradigmatic	People create new fields out of multiple metasystems. The objects of paradigmatic acts are metasystems. When there are metasystems that are incomplete and adding to them would create inconsistencies, quite often a new paradigm is developed. At the cross-paradigmatic, paradigms are coordinated.	An example is the wave equation as it is derived by coordinating the three metasystems: Newton’s law of motion, the Continuity Equation and the Ideal Gas Law.
14	Cross-paradigmatic	Cross-paradigmatic actions integrate paradigms into a new field or profoundly transform an old one. A field contains more than one paradigm and cannot be reduced to a single paradigm.	An example is string theory as it combines quantum physics and the theory of general relativity.
15	Meta-cross-paradigmatic	Metacrossparadigmatic actions reflect on various properties of crossparadigmatic actions seeing with the crossparadigms are consistent, possibly true and determining other properties of crossparadigms.	Show that String Theory and Membrane Theory are incomplete because they do not account for dark matter and dark energy.

1943). The perceived value of reinforcement of a behavior affects the frequency of that behavior. If the value of the reinforcement of a behavior is high, the likelihood of that behavior occurring is greater, whereas if the value of reinforcement of a behavior is low, the likelihood of that behavior occurring is low. For example, consider achieving good grades as the reinforcement obtained through the behavior of good study habits. If getting good grades is of high value to a student, the likelihood of the student maintaining the good study habit is greater. However, if getting good grades is not of high value to a student, the likelihood of the student developing and maintaining a good study habit is low. The rate of behavior at all times is directly proportional to the obtained rate and value of reinforcement of behavior action (Herrnstein, 1970).

b) A second factor, is discounting, which refers to the process by which a reinforcement loses its value or effectiveness with delay between the behavior and the consequential reinforcement. In other words, discounting occurs when reinforcers received in the far future are worth less than reinforcers received in the present. Discounting decreases the likelihood of the behavior occurring as the value of the reinforcement decreases due to delay between the behavior and consequential reinforcement. In more popular parlance, this is often referred to as impulsiveness or the “inability to delay gratification.” For example, consider a person who chooses to party with his friends one night instead of using that time to prepare for his job interview the next day. In this case, he discounted the reinforcement he might get by preparing for his job interview and possibly getting the job. He chose the immediate pleasure he would get from partying with his friends over the possible delayed reward he would get by preparing for his interview and doing well in it.

c) A third factor, is risk. It is represented by how sensitive an individual is to a change in delay of reinforcement or punishment. Risk is usually associated with an increase in delay. To obtain a desired behavior, the perceived risk may have to be increased or decreased depending on how the risk affects the behavior. High perceived risk leads to avoidance of behavior and low perceived risk leads to continuation of behavior. For example, consider students who avoid taking writing intensive classes. They perceive the risk of their papers being critically evaluated by the teacher to be very high. Although this may hinder them from attaining their undergraduate degree, because their perceived risk of taking a writing intensive class is very high, they avoid the behavior. In this case, the perceived risk has to decrease. Consider another example of hoarders who have their yards full of garbage, old cars, broken compressors, and old building material. The perceived risk of bothering the neighbors so that they call the health department by collecting unnecessary goods is low. Thus they continue to hoard goods and cause trouble in the neighborhood. In this case, in stopping them from hoarding goods, the perceived risk has to increase.

d) The fourth factor is cost, which represents the change in value of reinforcement. Costs are negative consequences of problem behavior or the lack of behavior. Problem behaviors persist as people misjudge the cost of such actions or inaction. Inaction is often thought to be different from action. However, inaction is inhibition of action which, in itself, is an action. Both inaction and problem behavior change when people understand the cost of such behaviors.

Interaction between stage and value

Value of an outcome (reinforcement or punishment of a behavior), as well as the discounting of that value over time, is affected by an individual's stage of development. Stage and value are related to each other in numerous ways (Commons, Grotzer & Davidson, in press; Commons & Barry-Heffernan, 2012).

First, the stage of understanding of the *contingencies* between one's own behavior and the consequences of that behavior may affect which behaviors one engages in. Contingencies are the rules for delivering reinforcers and punishers. Effective contingencies either maintain or alter a behavior. Contingency is the relationship between the stimulus cue, the response behavior and the reinforcement of that behavior (Skinner, 1969). Some contingencies are simpler, such as, being given a sticker for behaving well. Some contingencies are more complex, such as, the contingencies involved in creating a fairer social group. Individuals who appreciate complex contingencies may be more likely to behave in ways that bring long term benefits to themselves and others (Commons & Heffernan, 2012). Thus, the behavior of acting in ways that bring more long term benefits obtains more value. Such individuals, who appreciate complex contingencies, discount the value of future reinforcements less often because the value of those future reinforcements increases. Thus, individuals who perform at a higher stage tend to appreciate complex contingencies, whereas, individuals who perform at a lower stage tend to appreciate simple contingencies. Individuals who perform at a high stage also discount less.

For example, if students performing at a low stage have an exam to study for, the value of the immediate reinforcement they get from watching television instead of studying would be high due to discounting. They would find watching television more reinforcing than studying for the exam. They would discount the value of future reinforcement of performing well in the exam and choose to watch television instead of studying. However, if the students are performing at a high stage, they would not discount the value of reinforcement for what they would get in the future. Studying and performing well in the exam would be more reinforcing to them than the immediate reinforcement they would get from watching television.

Another example can be drawn from the following scenario. If an individual sitting five feet away had a finger on a dooms day button that when pressed would blow up the world, would one shoot that person (L. Kohlberg, personal communication, 1987). If one places emphasis on the simple contingency such as not killing a person is the moral thing to do, one would discount the complex contingency of killing a person to save the world. An individual performing at a low stage would pay attention to the simple contingency and would not kill the individual with a finger on the dooms day button. However, an individual who performs at a high stage would understand complex contingencies and would kill the person to save the world. The reason for the discrepancy between individuals who perform at higher and lower stage in understanding contingencies could be that individuals who perform at lower behavioral developmental stages have been associated with toleration of shorter delays in reinforcement (Mischel, Shoda & Rodriguez,

1989). In addition, people who perform at a higher stage are also better able to assess the risk and cost of behaviors with short term reinforcement.

Second, high reinforcement value of an outcome affects stage. If high reinforcement is contingent upon a high stage behavior, individuals come to perform at a high stage. For example, individuals with higher income perform at a higher stage. This can be inferred from a study done to assess the relationship between peddlers' income and the developmental stage at which they performed (Commons-Miller, Commons, Li, Miller, Golino, Tuladhar, 2012). The study showed that stage and income are positively correlated ($r(53) = .506, p < 0.05$). High income has high reinforcement value. High reinforcement value motivates individuals to work in higher stages. Thus, when individuals obtain high reinforcement for performing at higher stages, they demonstrate high stage behavior.

Likewise, if high reinforcement is contingent upon a low stage behavior, individuals perform at a low stage. For example, when people are bribed with a large sum of money, they may act in unwise or immoral ways. A large sum of money is a reinforcer of a large value; acting in immoral ways is a lower stage behavior. An example of a situation in which a person may choose to perform at a low stage due to a large value of reinforcer can be drawn from the movie, *Indecent Proposal*. In the movie, David and Diana are a happily married couple who go broke and lose their house. A billionaire John Gage offers David a million dollars for a night with his wife, Diana. David and Diana ultimately decide to take the offer. In this situation, David and Diana were in great need of the money. A million dollars was very high in value for them. Hence, they chose to engage in a low stage behavior. Thus, when high reinforcement is contingent upon a certain stage behavior (high or low), individuals tend to perform at that stage.

Third, low reinforcement value may prevent individuals from performing at a high stage. For example, a behavior that evokes anxiety has low reinforcement value. The low reinforcement value of the anxiety provoking activity prevents people from performing that behavior.

Behavioral problems

A pattern of behaviors including rumination, avoidance, self-medication, dissociation, denial and its stronger form—"negative delusion" emerges among people with behavioral problems. This pattern in turn affects individual behavioral developmental stage and value of outcome of a behavior. There have been studies that have shown that most people with a behavioral problem tend to ruminate about their problems. For example, people who have gone through a traumatic event or significant loss ruminate. Rumination, thoughts about past events, as well as anxiety about possible danger in future, has been suggested to be both a symptom of posttraumatic stress disorder (PTSD), and also an important maintaining factor of PTSD (Ehlers & Clark, 2000). Studies have shown that there is a positive correlation between severity of obsessive compulsive symptoms and obsessive rumination, even after controlling for depression (Wahl, Ertle, Bohne, Zurowski, & Kordon, 2011). Similarly, people who score high on covert narcissism tend to have high levels of expected rumination (Atlas & Them, 2008).

Individuals with behavioral problems also experience negative delusions. They do not apprehend negative consequence or the cost of the problem behaviors they engage in. They often do not appreciate the cost of their inactivity, having a negative delusion about the passage of time itself. There also oblivious to the pleasure of their achievements. In some cases, even if they do understand the costs, they are not able to inhibit those behaviors, because they only respond to short term reinforcements, and they heavily discount behaviors eliciting long-term reinforcement. This observation is especially true for people with personality disorders. For example, Coffey, Schumacher, Baschnagel, Hawk and Holloman (2011) showed that impulsivity and discounting of delayed reinforcement was significantly greater in participants with BPD than participants who did not have BPD or participants with substance abuse disorders. Negative delusion leads to the continuation of problem behavior. A number of individuals with behavioral illness also engage in avoidance of anxiety provoking behaviors, since avoidance gets negatively reinforced. This approach becomes problematic when those anxiety provoking behaviors are important to those individuals to meet their goals. They engage in other problematic behaviors to avoid the anxiety provoking behaviors. Addiction (Self-medication) is an example. People drink alcohol to cope with their stress. Fouquereau, Fernandez, Mullet, and Sorum (2003) showed that alcoholics had significantly greater urges to drink after reading about stressful scenarios than did non-alcoholics. Dissociation is also prevalent among people who go through or have gone through trauma. This is especially true when a person cannot escape the traumatic event (Freyd, 1996).

Dynamic therapies, like most descendants of psychoanalysis, would view rumination as a defense that may be the result of past unresolved conflicts. The rest of the above mentioned behavioral problems would be explained as defenses employed by individuals to protect themselves from certain outcomes (Corsini & Wedding 2008). Dynamic therapists would work on helping these individuals gain insight into their own behaviors. Cognitive behavior therapists, on the other hand, would work on helping such individuals alter their maladaptive emotions and behaviors through desensitization to help them think more "rationally" (Lambert, Berg, & Garfield, 2004). Behavioral problems seem to reciprocally interact with the behavioral developmental stage and valuation of outcome of a behavior of an individual. Although the outcome of most therapies result in a raise in stage, neither Dynamic therapies nor CBT overtly work towards altering an individual's behavioral developmental stage and valuation of outcome of a behavior. DBAT successfully addresses these two variables. How behavioral problems affect stage and value will be discussed in the following section.

How behavioral problems affect stage and value

The above behaviors of individuals with behavioral problems tend to affect stage and value. Behavioral problems either freeze or decrease the behavioral developmental stage at which individuals function. For example, avoidant behavior hinders individuals from progressing on to the next stage of development. When individuals do not confront conflicts about trauma and loss, they do not give themselves a chance to process the event and evaluate it from the perspective of a higher behavioral developmental stage. Likewise,

rumination also freezes the behavioral developmental stage of a person. Researchers in information processing have theorized that one of the factors limiting working memory is conflict in information processing. Pascual-Leone (2004) established that working memory is constricted when individuals are dealing with a misleading situation (situation that hinders individuals from the task at hand). Dealing with such situations requires them to interrupt *misleading schemes* (schemes that hinders task at hand). Interrupting misleading schemes also interrupts *task-activated schemes* (schemes required to solve the task). Consequently, task-activated schemes will have to be activated by using more space in the working memory to solve the task at hand. It can be inferred that rumination is an example of a misleading situation. Individuals who ruminate are not able to successfully activate task-activated schemes. This may freeze one's behavioral developmental stage. Horowitz (2001) came up with a similar theory on rumination and information processing. In explaining his *Completion Principle* on stress response syndromes, he stated that when individuals do not successfully process their stressful events or problems, the unprocessed problems occupy their working memory which leads to rumination and repetitive evocation of emotions such as guilt, fear, anger and anxiety until the information is completely processed. Thus, we infer that since rumination hinders information processing and affects cognitive development, it also freezes behavioral developmental stage. Similarly, the value of behavior reinforcement or punishment is also affected by behavioral problems. In most cases, individuals with such problems do not assess the cost of a problem behavior. For example, people may have "negative delusions" by not seeing, denying or even not understanding the cost of their problem behaviors. In some cases individuals may be employing what Freud (1968) would call *minimization* because they know that a behavior is problematic, but they deny the severity of the consequences of those behaviors. In other cases, individuals simply *deny* the negative consequences of their problem behavior altogether. In J's case, he knew that his inactivity was problematic, but he did not realize the severity of the consequences of his inactivity. He did not understand that the cost of his inactivity was that he would not get admission to a graduate school. He thought that being involved in research was enough to get into graduate school. He denied the need to do all the other preparations to get into graduate school. Such people also tend to discount the value of desirable behaviors as they tend to overestimate the risks of such behaviors. J overestimated the risk of preparing for GRE and looking for mentors with whom his interests matched. The risk for J in this case was the immediate displeasure and stress associated with those activities.

» J'S BEHAVIORAL DEVELOPMENTAL STAGE AND VALUE

The preceding sections established the importance of stage and value in changing problematic behaviors and how behavioral problems affect stage and value. This section presents how a DBA would perceive J's problem behavior in terms of his behavioral developmental stage and his valuation of reinforcement of engaging in behaviors that would help him get into a graduate school. The DBA would identify J's problem behaviors and the lack of

behaviors, such as, his unawareness of what would help him be a strong candidate for a doctorate program. Another variety of therapists might inquire whether a Ph.D. program and being a strong candidate were of interest to J. If the answer is no, this would be a very different approach from DBAT. DBAT would posit that his answer in the negative may be due to J's lack of understanding of how the world works, not because he was not interested in graduate school. However, if J did agree that going to graduate school was of interest to him, his lack of understanding included the need to study for the GRE, giving presentations at conferences and having publications. J thought that being bureaucratic by having good grades, some minor research experience, and filling out the forms would be enough to get him into graduate school. He was not aware that he had to understand the structure of the organization. He did not understand that there had to be a good correspondence between prospective advisors and himself. He did not read about prospective advisors and their research. He made no effort to correspond with them. He did not understand that advisors are looking for students who could advance their research. In addition, he did not understand established procedures to make his graduate school application stronger. He did not understand that getting exceptional GRE scores and having research success would increase the chances of an advisor picking him. He did not know how to study for the GREs. He did not understand the probabilistic nature of admissions and that he needed to apply to at least 12 graduate schools of varying competitiveness. He did not understand that he needed to write his biography (statement of purpose) as a motivated individual showing how his interest and successful actions developed without engaging in self-evaluation. He had to get strong letters of recommendation. However, he was not aware that he needed to supply his recommenders with not only a list of schools, but also his curriculum vitae and statement of purpose. To understand this entire process, he had to perform at a systematic stage (Commons, Miller, Goodheart, & Danaher-Gilpin, 2005). However, he did not understand these issues as he was performing at a formal stage. Thus, the DBA would aim to help J move up a stage to help him understand what would help J become a strong candidate for a Ph.D. program.

Raising stage, by itself, is not sufficient to alter J's behavior. The DBA would work on changing his valuing and discounting as well. First, J discounted the positive value of the consequences he would obtain from preparing for Graduate Record Exam (GRE) or getting his work published. This was because the reinforcement would not be an immediate one. He would not get into a graduate school as soon as he was done with his GRE or getting published. Without immediate outcomes, such as, checking off items in a to-do-list, he refrained from engaging in those behaviors. Second, his perceived risk of engaging in those activities was too high. He perceived the discomfort he would get from engaging in those activities to be very great. This led to his avoidance of those behaviors. Third, he did not understand the cost of not engaging in those behaviors. He did not comprehend that avoiding those behaviors would hinder him from getting into a graduate school. Thus, in addition to raising J's stage of performance, the DBA would also work on increasing J's tolerating the delays of reinforcement, decreasing perceived risk of the desired behavior and correctly estimating

the cost of his problematic behavior. The procedures involved in raising stage and altering value are laid out in the second part of this paper. The procedures are divided into alliance building, presteps in intervention and intervention. Presteps in intervention include identifying problem behaviors, recognizing stage of problem behavior, assessing how delay discounting and perceived risks affect the problem behavior, setting target behavior, targeting small behavioral change to win the advisee's trust and identifying necessary skills or subtasks to overcome the problem behavior. Intervention includes setting boundaries, setting contingencies, helping the advisee recognize the cost of problem behavior, measuring sensitivity to reinforcement by measuring preference and using it to reinforce the target behavior, increasing the rate of responding in one area to increase rate of action in another and other supplemental therapies/training.

» DISCUSSION

DBAT is the first behavioral analytical therapy that incorporates behavioral developmental stage and value of outcome of a behavior into its working. It is quite different from conventional therapies as it focuses on altering problem behaviors directly to help individuals live satisfying lives despite their existing behavioral problems. It could be a good adjunct to contemporary therapies as it approaches behavioral problems by aiming to raise one's behavioral developmental stage and alter their value of outcome of a behavior. There is evidence that behavioral developmental stage affects an individual's behavior (Kurtines & Gewirtz, 1984; Lickona, 1976). Moreover, behavioral developmental stage also seems to affect the kind of defense mechanism one uses, in the psychoanalytic sense, which in turn affects one's behavior (Semrad, 1969A, B, C). Hence, developmentally based behavior therapy, such as DBAT, could be a very useful adjunct to the existing therapies.

Professionals to whom this therapy could be particularly useful are psychologists, clinical social workers, psychiatrists, and psychoanalysts who work with college and graduate students. This therapy would particularly work on high functioning individuals who have a potential for a raise in stage.

Although DBAT is a new kind of therapy that may be beneficial to many individuals, there might be doubts about how different it actually is from already existing interventions, its use and effectiveness. We recommend that DBAT be used in conjunction with other existing interventions such as CBT, DBT and ACT.

Superficially, DBAT may resemble coaching to the extent that both involve the proffering of advice. However, DBAT can be distinguished from coaching in the respect DBAT has specific theoretical bases. Moreover, DBAT also addresses behavioral problems. Coaching does not address behavioral problems.

A possible critique of this therapy would be that it does not directly address maladaptive emotional behavior and only focuses on changing operant behaviors. Whereas, CBT addresses maladaptive emotional behavior separately, DBAT indirectly addresses such emotional behavior. DBAT gets the person to engage in an operant behavior that exposes them to positive reinforcement that competes with the maladaptive emotions. For example, proponents of DBAT helping J study for GRE, get publications, apply to graduate

school and get admitted to one, the maladaptive emotions related to being stuck will subside. Also, it alters the problem behaviors that trigger the maladaptive emotions.

DBAT is also different from dynamic therapies because it works on improving individuals' social perspective taking skills (Insight into others' perspectives). Dynamic therapy on the other hand works on helping individuals gain insight into their own conflicts. Additionally, DBAT focuses on the individual's present and does not delve into the past. Dynamic therapies help individuals understand their conflicts rather than overcome their problem behaviors associated with perspective taking. However, DBAT tries to do so by helping individuals perform at a higher behavioral developmental stage and altering their values and their discounts regarding the outcome of behaviors that compete with those problem behaviors.

Another possible critique may question the usefulness of DBAT in that it does not cure the mental illness itself, but rather only works towards managing and ameliorating "symptoms". It is true that DBAT only targets certain problematic behaviors and is suggested as an adjunct to existing therapies instead of a replacement as mentioned above.

One question regarding the effectiveness of DBAT could be as to how individuals continue to behave in desirable ways following termination of therapy. This would be a valid concern because this therapy is highly instructional and requires the DBA to provide explicit advice and supervision to the individual during the course of therapy. The question arises of dependency on the DBA for the continuation of desirable behavior since the analyst provides close guidance to the individual to overcome the problem behavior. Although this is a valid concern, DBAT works towards making an individual achieve desired behaviors ultimately with the aid of real world contingencies, rather than self-induced ones. This ensures the continuation of desired behavior as the behavior becomes dependent on real world contingencies and not the contingencies set by the DBA. The acknowledgement of the importance of real world contingencies in maintaining a desired behavior is an advantage DBAT has over other behavioral analytic therapies. Contemporary behavioral analytic therapies do not place an emphasis on real world contingencies to maintain a desired behavior which is why they often do not have high success rates. For example, most weight loss programs have failed as individuals do not continue to engage in desired behaviors once they are out of the program. A meta-analysis of US studies in long-term weight-loss maintenance showed that in five years, subjects who underwent structured weight-loss programs were able to maintain weight loss of only 3% less than their initial weights (Anderson, Konz, Frederich, and Wood, 2001). The procedures regarding setting contingencies are discussed and explained in greater detail in the second part of this paper.

This paper introduced DBAT, discussed the theoretical underpinnings of the therapy and made a case for the importance of a behavioral therapy utilizing a developmental behavioral perspective. We direct the audience to the sequel of this paper for more information on the application of this therapy. It discusses how this therapy initially emerged, lays out the sequence of procedures of this therapy and presents case studies of six individuals who underwent the therapy and had relative success in altering their problem behaviors. ■

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