

Mindfulness-Based Approaches to Impulsive Behaviors

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The ability to think and act quickly and effectively may have some evolutionary benefits, in which immediate response has important consequences for survival. In our modern world, impulsive behavior may even allow some individuals to express desires in a healthy-albeit defiant-manner. Jetting off on an unplanned vacation, going on a shopping spree, or taking a day off work may represent welcome relief in the quotidian life. However, impulsive actions also have consequences, and impulsiveness has been linked to a variety of high-risk behaviors and a number of psychiatric illnesses. Impulsivity is considered an important element of suicidal behaviors, substance abuse, aggression, personality disorders, attention deficit problems, and criminal behavior (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Although impulsivity is directly mentioned in the *Diagnostic and Statistical Manual of Mental Disorders-IV* (DSM-IV; APA, 1994) criteria for several disorders, little research has attempted to uncover the role of impulsivity in

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psychiatric disorders (Moeller et al., 2001).

Impulsivity may be variously defined as the tendency to act with less forethought than do most individuals of equal ability and knowledge (Dickman, 1993), a lack of behavioral inhibition (Moeller et al., 2001), or risk-taking, lack of planning, and making one's mind up quickly (Eysenck & Eysenck, 1977). Likewise, impulsivity may be conceptualized as a set of discrete subcomponents of cognitive functioning, as put forth by Patton, Stanford, and Barratt (1995): acting on the spur of the moment (motor activation), not focusing on the task at hand (attention), and not planning and thinking carefully (lack of planning). Disagreements about how to define and measure impulsiveness have inhibited the understanding of how such behaviors factor in mental illness, as well as the ways in which impulsive behaviors may be treated.

In a recent review of research on impulsiveness, Moeller et al. (2001) propose a model of impulsivity as the "decreased sensitivity to *negative* consequences of behavior; rapid, unplanned reactions to stimuli before complete processing of information; and lack of regard for long-term consequences" (p.1784). Impulsivity is also defined as a predisposition, and part of a pattern of behavior rather than a single act (Moeller et al., 2001). Recent research has indicated that the prefrontal cortical areas of the brain, where the brain's supervisory management system is located, show some functioning impairments that interfere with deliberative behavior. Manuck, Flory, Ferrell, Mann, and Muldoon (2000) found preliminary evidence of an association between a variant of the gene for monoamine oxidase-A (MAOA) and individual variability in aggressiveness, impulsivity and central nervous system responsiveness. Among male participants, the MAOA variant showed significantly less activation in the areas of the brain responsible for shaping and measuring proper response or reflex and moderating emotion

(Manuck et al., 2000). Such genetic predispositions may then couple with emotionally disorienting life experiences, resulting in a characterological pattern of impulsiveness.

Although impulsiveness may be present in any individual with or without a psychiatric diagnosis, impulsive behaviors are more likely to be components of certain disorders, such as personality disorders, mania, and substance dependence. The DSM-IV defines "impulsivity or failure to plan ahead" (p. 706) as one criterion for antisocial personality disorder. Impulsiveness is also a major component of borderline personality disorder, and the DSM-IV cites a diagnostic criterion as "impulsivity in at least two areas that are self-damaging (e.g., spending, sex, substance abuse, reckless driving, binge eating)" (p. 710). The interface between impulsivity and emotion is a particularly salient issue that manifests in borderline personality disorder, and impulsive behavior and emotional reactivity may be consequences of poor emotion regulation. Negative affect states, such as found in bulimia nervosa, may also trigger impulsive behaviors (e.g., binge eating and purging).

Despite the prevalence of impulsiveness in different psychiatric disorders, research has failed to pinpoint effective treatment course (see Moeller et al., 2001, for a review). Most studies focus on impulsive aggression, in part because these types of behaviors may be more easily measured than other aspects of impulsivity. Indeed, impulsiveness is most manifest in high-stakes situations, and is thus difficult to capture in a laboratory environment (Carey, 2006). Impulsiveness has been associated with negative affect states and emotion dysregulation (Erisman, Salters-Pedneault, & Roemer, 2005), although it is unclear whether impulsiveness is a consequence or contributing factor to emotion dysregulation. Emotion regulation is often conceptualized as the capacity to control emotional experience, and adaptive regulation may involve the ability to flexibly regulate emotion in

accordance with environmental demands (Thompson, 1994). Impulsivity may inhibit an individual's ability to effectively control emotional experiences, or it may be a maladaptive response to negative emotional states.

Surprisingly, little research has examined the effect of certain cognitive behavioral therapies of the specific manifestations of impulsivity. In particular, mindfulness based approaches in cognitive therapy suggest promise in the treatment of impulsive behaviors due to the antithetical nature of mindful awareness and impulsivity. If impulsiveness has been defined as swift action without conscious planning or awareness and rapid emotional reactivity, mindfulness is the contrary; mindfulness is defined as "paying attention in a particular way: on purpose, in the present moment, and non-judgmentally" (Kabat-Zinn, as quoted in Segal, Williams, and Teasdale, 2002, p.121). The cultivation of mindfulness precludes impulsive thought and behavior through the maintenance of attention on the present moment and the qualities of acceptance, openness, and curiosity. Mindfulness has been incorporated into a variety of cognitive therapies, including mindfulness-based stress reduction (Kabat-Zinn, 1990), mindfulness-based cognitive therapy (Segal, Williams, & Teasdale, 2002), dialectical behavioral therapy (Linehan, 1993b), and acceptance and commitment therapy (Hayes, Strosahl, & Wilson, 1999). Although the mindfulness literature considers impulsiveness as a factor in other psychiatric disorders, little research has explicitly investigated the association between impulsivity and mindfulness skills.

For the purposes of this review, mindfulness-based approaches to cognitive therapy will be evaluated in terms of the capacity to control or inhibit impulsive patterns of action and thought. Impulsiveness will be conceptualized as acting on the spur of the moment, not focusing on the task at hand, and lack of planning. Specifically, the behaviors of binge-eating, impulsive self-

injurious behaviors and parasuicidal acts, and substance abuse will be evaluated as aspects of impulsivity previously under-represented in the literature on mindfulness-based approaches to cognitive therapy. Although various therapeutic interventions will be presented, emphasis will be placed on the specific mindfulness techniques employed in the treatment of the impulsive behaviors and emotional reactivity associated with bulimia nervosa, borderline personality disorder, and substance abuse disorders.

Mindfulness skills have been shown to effectively treat pain (Kabat-Zinn, 1990), depression (Segal, Williams, & Teasdale, 2002), and some components of borderline personality disorder (Linehan, 1993b). However, some debate exists as to how effectively mindfulness skills treat the specific components and symptoms of these disorders. A recent study by Erisman, Salters-Pedneault, and Roemer (2005) attempted to further elucidate the role of specific contributing factors in mental illness and the subsequent effect of mindfulness-based treatment. Erisman and colleagues conducted a preliminary analysis of the relationship between emotion regulation and mindfulness. Emotion regulation was conceptualized as the ability to control emotion and act in accordance with values while experiencing negative emotions (Erisman et al., 2005). Adaptive regulation of emotion may involve the flexibility to regulate emotion with the environment, and difficulties in appropriate management of emotions may factor prominently in a variety of psychiatric illnesses, including depression and anxiety. Moreover, poor emotion regulation may include high emotional reactivity, and the mismanagement of negative emotions may result in impulse control difficulties. The adaptive regulation of emotion has important consequences for the impulsive behaviors found in bulimia nervosa, borderline personality disorder, and some substance abuse disorders.

Erisman and colleagues (2005) hypothesized that mindfulness, defined as the "maintenance of attention on the present moment, as well as bringing a quality of curiosity, openness, and acceptance to that awareness" (p.1), may facilitate healthy engagement with emotions, and thus mindfulness would be correlated with emotion regulation. Erisman and colleagues analyzed responses on several self-report questionnaires developed to assess depression, anxiety, and stress, as well as the Difficulties on Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), and two indices to measure mindfulness: the Mindful Attention and Awareness Scale (MAAS; Brown & Ryan, 2003), and the Self-Compassion Scale (SCS; Neff, 2003). The SCS was included to assess the nonjudgmental, compassionate aspect of mindfulness that is not directly captured by the MAAS (Erisman et al, 2005). The DERS includes an impulse control subscale. Significant negative correlations were found between the impulse control subscale of the DERS and the MAAS, and the impulse control subscale and the SCS. Moreover, a regression analysis suggested that mindfulness skills may predict impulse control strategies along with other emotion regulation strategies, although only the mindfulness component of kindness emerged as a significant unique predictor (Erisman et al., 2005).

This study is valuable in targeting the specific component of emotion dysregulation as an underlying factor for a variety of functioning difficulties. The authors suggest that mindfulness skills may be beneficial in the treatment of problems associated with emotion dysregulation, especially those mindfulness skills used to foster self-acceptance and compassion. However, less clear is the extent to which impulsiveness factors in emotional dysregulation, and whether impulsiveness is a valid marker of problems with adaptive emotion regulation. Emotional dysregulation may lead to impulsive behaviors, but since no direct measure of impulsivity was used in this study, conclusions about the direct relationship between mindfulness skills and impulsivi-

ty are limited. However, this study suggests an interesting link between mindfulness and the emotional component of impulsiveness, which may be reflected in other psychiatric disorders. Indeed, most conceptualizations of impulse-related disorders include a model of emotional dysregulation (Ivanoff, Brown, & Linehan, 2001; Linehan, 1993a; Telch & Agras, 1996).

Bulimia nervosa and binge-eating disorder are hypothesized to have a significant etiological component of emotional dysregulation. Dialectical behavioral therapy for bulimia nervosa views binge eating and purging as attempts to influence, change, or control painful emotional states (Safer, Telch, & Agras, 2001). Individuals with binge-eating disorder appear to suffer from elevated anxiety and dysphoria, distorted and reactive thinking behaviors, and disturbed awareness of normal physiological cues related to food intake (Kristeller & Hallett, 1999). Bingeing is characterized as the intake of large amounts of food accompanied by feelings of lack of control (Kristeller & Hallett, 1999). Thus, bingeing behaviors, along with the difficulties and subsequent consequences of emotional dysregulation, may reflect a high level of impulsivity. Mindfulness skills, by facilitating self-regulation, enhancing insight, and integrating the emotional, cognitive, and behavioral aspects of functioning, have been studied as a useful tool in the treatment of eating disorders. By promoting awareness of physiological symptoms, mindfulness meditation may increase the ability to recognize normal satiety cues (Kristeller & Hallett, 1999).

Kristeller and Hallett (1999) studied the outcome of mindfulness based cognitive therapy on women with a diagnosis of binge eating disorder (BED). The participants attended seven treatment sessions over a six-week period, of which the primary focus was the use of mindfulness meditation in three forms: general mindfulness meditation, eating meditation, and mini-meditations. General mindfulness meditations were conducted to develop

focused attention and awareness, whereas eating meditation applied this approach toward the behaviors, beliefs, and emotions associated with food intake. Mini-meditations consisted of taking a few moments to stop and become aware of thoughts and feelings, such as at times prior to meals or binges.

Participants completed depression and anxiety inventories, along with a rating scale for binge eating severity and preoccupation, throughout the course of treatment and at follow-up. Participants also completed weekly logs of binge eating episodes and rated feelings of self-control and mindfulness. Kristeller and Hallett (1999) found that the number of binges reported per week decreased significantly over treatment. Perceived levels of control, sense of mindfulness, and awareness of hunger cues and satiety cues all increased significantly, although there was no overall change in weight. Both depression and anxiety decreased significantly, from mild to moderate levels to non-clinical levels, on average.

Kristeller and Hallett (1999) report that the participants spent an average of 15.82 total hours ($SD = 3.15$) meditating, with the greatest amount of time spent in general meditation exercises. Time spent using the eating meditation was related to change in the Binge Eating Scale scores ($r = .66, p < .01$), and a decrease in number of binges was related to an increase in sense of eating control ($r = .73, p < .001$) and a sense of mindfulness ($r = .76, p < .001$). Amounts of meditation practiced did not predict change in sense of mindfulness. The findings suggest that mindfulness and increased awareness of satiety cues may be particularly useful for increasing control of binge eating. Furthermore, Kristeller and Hallett report that many participants used a forgiveness meditation to resolve feelings of anger towards parents or husbands, feelings that they identified as having been common binge triggers. This finding may represent the important role of emotional regulation in impulsive and com-

pensatory binge eating behaviors.

Despite the promising results of Kristeller and Hallett's study, several limitations must be discussed. The study had a small sample size and did not include a control group. Moreover, both the treatment length and follow-up period were very short. Although the study was intended to be exploratory, the findings may not accurately predict a formal mindfulness-based treatment for binge eating disorder. The participants in this study reported meditating for less than 16 hours total, or about 2.5 hours per week. In contrast, the mindfulness-based stress reduction program developed by Kabat-Zinn (1990) requires participants to meditate no less than 4.5 hours per week. The limited meditation practice employed in this study differs from established guidelines for therapeutic meditation practice, and thus raises some questions about the efficacy of Kristeller and Hallett's treatment program. Moreover, the results may reflect the nonspecific effects of therapy rather than mindfulness techniques, as may be proposed by the failure to detect a relationship between the amount of meditation practiced and change in sense of mindfulness. Further studies must separate the formal meditation elements from the aspects of treatment more common to standard cognitive behavioral intervention.

Safer, Telch, and Agras (2001) applied a more stringent mindfulness-based cognitive therapy to the treatment of bulimia nervosa. Safer and colleagues randomly assigned female patients with bulimia nervosa to either 20 weeks of dialectical behavior therapy or 20 weeks of a waiting-list comparison group. The participants completed baseline and post-treatment measures for depression, anxiety, positive and negative affect, self-esteem, and eating disordered behaviors and emotions. The treatment was adapted from Linehan's (1993b) Skills Training Manual for Treating Borderline Personality Disorder and was specifically aimed at teaching emotional regulation skills to reduce rates of

binge eating and purging (Safer et al., 2001). Although no specific measures of mindfulness were included in the study, dialectical behavioral therapy (DBT) uses several mindfulness meditation techniques that have been shown to be effective for the treatment of both borderline personality disorder and bulimia nervosa (Linehan, 1993a; Wisner & Telch, 1999).

At baseline, the participants reported a median of 25 binge episodes and 32 purge episodes over the past 28 days (Safer et al., 2001). Upon completion of treatment, 64% of participants in the DBT group were abstinent from or reported a significant decrease in binge eating/purging behaviors. In comparison, 80% of the participants in the waiting-list group continued to be symptomatic. Safer and colleagues' (2001) results suggest that DBT, and specifically the teaching of adaptive emotion regulation skills, is effective for reducing rates of binge eating and purging. The authors suggest that DBT "works more by decreasing participants' vulnerability to negative emotions associated with the urge to binge and purge than by directly targeting areas such as self-esteem and overall impulsivity" (p. 634). The results from this study emphasize the importance of the relationship between negative affect control and disordered eating, and diminish the role of impulsivity. Given the interface between emotion dysregulation and impulsivity, improvement in the regulation of negative emotional experiences may coincide with a decrease in impulsive behaviors, regardless of treatment emphasis. Further investigation of the relationship between emotion regulation and impulsivity in binge-eating disorders is warranted.

Although dialectical behavioral therapy has been shown to be effective for the treatment of bulimia nervosa, the treatment was originally developed for the treatment of borderline personality disorder (BPD) (Linehan, 1993a). BPD is conceptualized as an inherently complex disorder that features "a pervasive pattern of instability of interpersonal relationships, self-image, and affects,

and marked impulsivity" (DSM-IV, 1994, p. 706). Perhaps one of the most pressing concerns in the treatment of BPD is the reduction of parasuicidal acts and self-harming behaviors. Parasuicidal acts comprise any non-fatal self-injurious behavior with clear intent to cause bodily harm or death that results in actual tissue damage, illness, or risk of death (Ivanoff, Brown, & Linehan, 2001). Patients with BPD often engage in a variety of impulsive behaviors that include parasuicidal acts, eating binges, and alcohol or drug abuse. In developing a model for treating these types of impulsive behaviors, Linehan (1993a) views such actions as a function of limited problem-solving abilities and emotional dysregulation. Impulsive self-injurious behaviors may help some individuals cope with life problems that cause intense suffering by reducing the emotional pain or cognition linked to suffering, and may also help to communicate emotional pain to others, in turn validating that pain to others and eliciting help (Ivanoff et al., 2001).

DBT incorporates skill sets to address emotional regulation, distress tolerance, and problem-solving strategies. Mindfulness skills are also taught in DBT as a way to control attention, develop awareness, and attune to a sense of true self. Patients learn to just observe, and then to describe external and internal stimuli. Particularly among individuals with impulse control difficulty, acknowledging and labeling affective states is a major goal (Ivanoff et al., 2001). McQuillan and colleagues (2005) recently investigated the effectiveness of intensive DBT among outpatients with BPD who were also in crisis. In this study, patients with BPD and a history of recent suicidal or parasuicidal behavior were referred to an intensive DBT treatment program, with a particular emphasis on mindfulness. After completion of the program, patients showed significant improvements on depression and hopelessness measures. However, although the patients had a history of parasuicidal and suicidal behaviors, no specific measures addressed the outcome of these behaviors.

This is one glaring limitation of this study; the intensive treatment program was designed to prevent hospitalization for patients in crisis, and yet the authors do not report any outcome of suicidal acts. The authors attribute much of the treatment success to mindfulness skills, especially in the reduction of depressive symptoms. Interventions to reduce depressive symptoms and hopelessness should reduce the number and seriousness of suicide attempts (McQuillan et al., 2005), although this relationship was not confirmed by the study. The emphasis on mindfulness skills was discussed as being antithetical to impulsive behavior, thereby offering an effective technique by which to reduce impulsive suicidal and parasuicidal acts. Follow-up data for the study are necessary to assess the long-term benefit of mindfulness-based DBT for patients in crisis.

McQuillan and colleagues (2005) provide promising results for the treatment of BPD, especially as a short-term intervention. However, this study was not controlled and did not effectively address the outcome of the crises it initially sought to bypass. Most intriguing about this study was the emphasis on mindfulness skills, rather than on the other modules of DBT. Mindfulness skills may be the most salient component of DBT in this time-limited intensive treatment, in which adequate time for learning new adaptive skills is not possible. The findings from the study may represent a nonspecific effect of therapy and crisis intervention, rather than the usefulness of an abbreviated form of DBT or of mindfulness techniques. However, the intensive treatment allowed a large number of patients to be treated in a short time, which has important clinical implications. Further study may show that an intensive treatment period may be a precursor to more involved long-term therapy. The initial reduction in depression and hopelessness may encourage commitment to long-term treatment.

A recent Dutch study on DBT successfully targeted the effects of treatment on BPD and more specifically, the high-risk and impulsive behaviors associated with BPD. Verheul and colleagues (2003) conducted a 12-month randomized clinical trial in the Netherlands with women diagnosed with BPD. The patients were randomly assigned to DBT or treatment as usual (TAU). Recurrent parasuicidal and self-damaging impulsive behaviors were measured using the Borderline Personality Disorder Severity Index (BPDSI; Arntz et al., 2003), which is derived from the DSM-IV criteria for BPD. Self-mutilating behaviors were also assessed using the Lifetime Parasuicide Count (LPC; Comtois & Linehan, 1999).

Self-mutilating behaviors of patients assigned to dialectical behavioral therapy gradually diminished over the treatment year, whereas patients assigned to treatment as usual gradually deteriorated with respect to these behaviors. Patients in the DBT condition showed more improvement over time for self-damaging impulsive behaviors than patients in the control group. A significant three-way interaction between time, treatment, and severity was also found, indicating a trend towards greater effectiveness of DBT in severely affected individuals (Verheul et al., 2003).

Verheul and colleagues' (2003) study is important because it was the first clinical trial of DBT that was not conducted by its developer and that was conducted outside the United States. Perhaps most intriguing is the finding that severely affected patients in the TAU condition deteriorated over time, and reported more impulsive self-injurious behaviors by the end of treatment. Non-specialized treatment facilities might actually cause more harm rather than improvement, at least for these severely disordered patients (Verheul et al., 2003). Contrary to the findings of McQuillan and colleagues (2005), this study did not find any overall reduction in depression and hopelessness,

although Verheul and colleagues (2003) hypothesized that depression and other affect outcomes would be addressed in longer-term treatment. The impact of DBT on low-severity patients was shown to be similar to that of the TAU condition, leading Verheul and colleagues (2003) to suggest that DBT should be the treatment of choice for patients with severe, life-threatening impulse control disorders rather than BPD *per se*. The findings imply that patients with other severe impulse-regulation disorders, such as eating disorders or substance abuse, might also benefit from the therapy. One other interesting point must be noted: this study was supported by ZAO Health Insurance Company, Amsterdam. High-risk, impulsive behaviors are the aspects of BPD most likely to result in hospitalization, and the effective treatment and reduction of severe symptoms may be of particular interest to insurers. Thus, the findings of the study must be considered carefully.

A follow-up to Verheul and colleagues' (2003) study was conducted at 6 months after treatment (van den Bosch et al., 2005). The DBT condition continued to show lower levels of impulsive and self-mutilating behaviors than the TAU condition. However, the patients in the DBT group did not show any improvement during the 6-month period when no DBT was applied, which may suggest that a longer follow-up period might have even shown an extinction of the effect of DBT. Van den Bosch and colleagues (2005) suggest that once high-risk behaviors are sufficiently reduced and stabilization has set in, the retention or deepening of the treatment results requires prolonged treatment. Longer treatment or a follow-up of treatment with booster sessions is recommended (van den Bosch et al., 2005). However, since the most severely affected patients showed the greatest gains during treatment, these patients may be at the highest risk for relapse following treatment, therefore showing a deterioration of effects of therapy. BPD is a complex disorder that requires long-term treatment for the effective reduction of

negative affect states and impulsive behaviors.

The complexity of BPD and the associated impulse control difficulties often become the primary goal in treatment. Although self-injurious behaviors and parasuicidal acts may be the most common impulsive behaviors engaged by patients, substance abuse also plays a role in many patients with BPD. Individuals meeting criteria for BPD are more likely to also meet criteria for current substance abuse than individuals with other psychiatric disorders, with the exception of antisocial personality disorder (Linehan et al., 1999). Individuals who are comorbid for both disorders have significantly more psychopathology, self-destructive behaviors, and suicidal thoughts (Linehan et al., 1999). Linehan and colleagues (1999) addressed the effectiveness of DBT for the treatment of substance abuse among patients with BPD. In this randomized clinical trial, female patients were assigned to either 12 months of DBT or 12 months of treatment as usual (TAU). All patients in the DBT condition received the standard manualized therapy developed by Linehan (1993b), with the addition of a new set of organized interventions aimed at drug abstinence and a transitional maintenance program that consisted of tapered treatment with methadone or methylphenidate. Drug abuse was assessed using structured clinical interviews and urinalysis.

Results from an analysis of covariance showed significantly higher proportion of drug and alcohol abstinent days for subjects assigned to DBT versus TAU, and the DBT patients produced significantly more clean urinalyses than the TAU patients. At the 16-week follow-up, however, DBT patients showed significantly higher scores than TAU patients on the global adjustment scale and global social adjustment scale. The study suggests that DBT is more effective than TAU for the treatment of patients with BPD and comorbid substance abuse. However, the study has a number of important limitations. Linehan and colleagues con-

cede that the statistical power of this study is low, due to the relatively few subjects in each treatment condition. Treatment dropout for this study was high, but this fact is not particularly unique; high dropout rates among patients with BPD are common. Of note is that treatment dropout was lower for the DBT condition, and DBT was offered to patients for free, whereas TAU patients paid for therapeutic services. Therefore, Linehan and colleagues cannot rule out the possibility that the higher retention rate of DBT was not due to financial factors. Additionally, no significant differences were found between the two conditions for any other symptoms of BPD. Considering past research that suggests the superiority of DBT for patients with BPD (Linehan et al., 1991; Linehan, 1993a), this finding is curious. The sample may be too small to detect any differences between the two conditions. The study was also conducted at the institution where the treatment was developed, and the results may reflect factors associated with treatment allegiance, potentially contaminating a supposedly unbiased evaluation. Furthermore, although DBT utilizes mindfulness techniques, no explicit mention of mindfulness skills was included in the study. Therefore, no relationship can be stated for mindfulness techniques as a treatment for substance abuse.

Despite the tenuous findings of Linehan and colleagues' (1999) study, recent research suggests that mindfulness skills may be useful for the treatment of substance abuse. In a review of recent relapse prevention strategies, Breslin, Zack, and McMMain (2002) provide an information-processing analysis of mindfulness and the implications for treatment. Mindfulness offers acceptance-based techniques that complement the active strategies provided in cognitive-behavioral treatment (Breslin et al., 2002). Mindfulness skills may function as an exposure strategy, in which patients can begin to extinguish automatic avoidance of negative thoughts and feelings. Among substance abusers, these negative affect states are often a precursor to drug use. Mindful

attention to drug-relevant cues or triggers coupled with a conscious, nonavoidant behavioral response may desensitize the patient to the driving effects of emotional states (Breslin et al., 2002). With practice, mindful awareness of thoughts and behaviors may become the default manner of processing emotional and drug-related events (Breslin et al., 2002). Mindfulness also fits within an information-processing analysis of relapse in addictive disorders, in which memory and attention play a role in both positive and negative affect systems. Drug use is presumed to be governed by memory-based, drug-use action plans established by repetitive, stereotyped drug use and operate automatically, with little conscious awareness or effort (Tiffany, 1990). Mindfulness helps break this cycle by attuning to automatic processes and thoughts, and thereby contrasting with the automatic allocation of attention driven by substance abuse memory networks.

The antithetical nature of mindfulness and automatic or impulsive behaviors provides theoretical promise for the efficacy of mindfulness skills in the treatment of impulse control disorders. Mindfulness deploys conscious attention and awareness of thoughts and feelings, and allows the individual to detach oneself from emotions before automatic behavior is engaged. The association between emotion regulation and impulsiveness is undoubtedly important, and much of the research on impulse-control disorders has stressed the role of the underlying difficulties with emotion regulation. Painful negative affect states may spur the individual into acting quickly and reflexively to diminish the associated discomfort. Mindfulness strategies may represent a covert exposure strategy to negative affect states, as Breslin et al. (2002) suggest, or mindfulness may be incorporated as a shift in perspective from actor to observer, thus reducing the urgency inherent in an urge or emotion. Moreover, the benefit of relaxation may also attenuate stress and diminish the urge to act on emotions.

Mindfulness skills have been incorporated into a variety of therapies, and the effectiveness of such mindfulness-based treatment is still in need of careful evaluation. Mindfulness is easily integrated into cognitive therapy, as both approaches stress the role of the observation of thought, mood, and behavior (Marlatt & Kristeller, 1999). In contrast to cognitive restructuring, mindfulness seeks to change one's relationship to the thought rather than to change the thought itself (Breslin et al., 2002). Mindfulness can thus work in tandem with cognitive therapy by encouraging acceptance in the face of change, and can be used to aid the regulation of emotions through a detached awareness of thoughts and feelings. The key feature of acceptance and awareness is undoubtedly a major advantage of mindfulness-based treatment, and may facilitate change processes and encourage a more integrated approach to therapy, one that delivers both change and introspection through the de-centered approach to knowing oneself.

The current literature on mindfulness-based approaches to impulsive behaviors seems to support mindfulness-based cognitive therapy as an efficacious approach to treatment. Mindfulness skills have most prominently been evaluated as a component of dialectical behavioral therapy, and further research must separate out the mindfulness aspect in order to effectively assess the value of such techniques. One limitation of these studies, and all mindfulness-based research, in fact, is the relatively small numbers of researchers publishing on the subject. Although the limited body of research is promising, more studies are required to successfully target the benefits and applicability of mindfulness skills in treatment programs. Furthermore, most of the clinical trials utilizing mindfulness skills, and especially DBT research, have very few subjects. The majority of the subjects are White and middle-class, and almost all are conducted with women. Thus, it is difficult to generalize the results to a

larger and more diverse sample. More trials must be conducted by researchers other than the developer of DBT in order to adequately and fairly evaluate the treatment.

Although impulsivity factors highly in eating disorders, borderline personality disorder, and substance abuse disorders, impulsive behavior also is found in a variety of other psychiatric disorders as well as in non-clinical populations. Further study may uncover the role of impulsivity in other types of functioning problems and effectively target the root of impulsivity and subsequent treatment. Although impulsivity has been linked to emotional dysregulation, further study may illuminate other contributing factors to impulse control. For example, patients with BPD have difficulty modulating emotion and in some cases, this appears to be linked to early trauma (Winston, 2000). Trauma, in the form of sexual abuse, is also strongly correlated with self-mutilation, and self-mutilation in the form of cutting is often experienced as painless at the time, suggesting that it takes place in a dissociated state (Herman, Perry, & van der Kolk, 1989). BPD may be linked to post-traumatic stress disorder, and further study may evaluate the efficacy of mindfulness techniques in the treatment of trauma rather than on the manifestation of self-injurious behaviors. Mindfulness skills may also be used to treat the impulsive behaviors found in antisocial personality disorder, attention deficit disorders, or in mania. Mindfulness appears to have wide-ranging implications for treatment options, and further study may prove fruitful in this arena.

The clinical implications of treating impulsive behaviors are of great consequence, considering the type and severity of the behaviors. The development of efficacious treatment options for impulse control disorders is critical. Mindfulness may prove a useful tool in the treatment of such disorders, and study of mindfulness-based approaches to cognitive therapy is warranted. Although the literature regarding mindfulness-based treatments

is young, the results are promising. Future directions in the field must concentrate on isolating the specific effects of mindfulness skills beyond the more global effects of cognitive therapy. The cultivation of mindful awareness and attention appears to be a useful way in which to attenuate emotional reactivity, and the treatment of impulsivity and impulse-related disorders may depend upon such techniques.

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