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Behaviour Research and Therapy 44 (2006) 371–394

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## Solving the puzzle of deliberate self-harm: The experiential avoidance model

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Received 10 September 2004; received in revised form 28 February 2005; accepted 16 March 2005

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### Abstract

Despite increasing attention to the phenomenon of deliberate self-harm (DSH), the literature currently lacks a unifying, evidence-based, theoretical framework within which to understand the factors that control this behavior. The purpose of the present paper is to outline such a framework—the Experiential Avoidance Model (EAM) of DSH. The EAM poses that DSH is primarily maintained by negative reinforcement in the form of escape from, or avoidance of, unwanted emotional experiences. Literature on factors that may lead to experiential avoidance is reviewed, along with the mounting empirical evidence that DSH functions to help the individual escape from unwanted emotional experiences. The EAM integrates a variety of research on emotions, experiential avoidance, and DSH within a clinically useful framework that sparks novel research directions.

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*Keywords:* Self-harm; Self-injury; Self-mutilation; Experiential avoidance; Emotion; Emotion regulation

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## The puzzle of deliberate self-harm behavior

The act of deliberately injuring oneself is a puzzling behavior to understand, but one that has received increased attention from researchers in recent years (Brown, Comtois, & Linehan, 2002; Chapman, Specht, & Cellucci, in press; Favazza, 1998; Gratz, Conrad, & Roemer, 2002; Nock & Prinstein, 2004). When defined broadly as the deliberate, direct destruction or alteration of body tissue without conscious suicidal intent, self-injurious behavior occurs in various forms among several different populations (Favazza, 1998; Winchel & Stanley, 1991). For example, culturally sanctioned forms of this behavior (such as tattooing and body piercing) are seen among non-psychiatric populations, particularly adolescents and certain social sub-cultures (Favazza, 1998). Repetitive, stereotypical forms of self-injury are common among individuals with developmental disorders (Lesch & Nyhan, 1964) and cognitive disabilities (Carr, 1977). Some of the most severe forms of this behavior (e.g., self-immolation and auto-castration) are observed among individuals with psychosis (Favazza, 1998; Suyemoto, 1998). Finally, in other populations (i.e., among individuals with borderline personality disorder [BPD], post-traumatic stress disorder [PTSD], dissociative disorders, and/or depressive symptoms), self-injurious behavior occurs in the absence of cognitive deficits or psychosis, and appears to be linked with emotional distress (Favazza, 1998).

Despite the clinical relevance of self-injury, however, not all forms of this behavior have received research attention commensurate with their importance. In particular, although studies have examined self-injurious behavior among individuals with cognitive disabilities (e.g., Carr, 1977) and psychosis (e.g., Russ, 1992), few studies have empirically examined the functions or causes of self-injurious behavior among non-psychotic, cognitively normal adults. Therefore, the purpose of this paper is to present a theoretical model of this form of self-injurious behavior, which we will refer to specifically as deliberate self-harm (DSH). This model was developed to provide a clinically useful understanding of DSH, in the hope of guiding future research on this behavior.

Specifically, the model presented in this paper is a behavioral theory of DSH (the *Experiential Avoidance Model*, or EAM, see Fig. 1) based on the premise that DSH is a negatively reinforced strategy for reducing or terminating unwanted emotional arousal. Within this paper, theoretical and empirical literature that situates DSH within a broader class of *experiential avoidance* behaviors is reviewed. Although much of this literature has examined DSH within the context of BPD, it is relevant to DSH in general and has informed the development of our theory, which focuses on DSH across a variety of non-psychotic, cognitively normal, adult psychiatric populations. In contrast with other models of this behavior that focus more specifically on certain clinical populations (e.g., BPD; see Linehan, 1993), the EAM was developed to apply to DSH at a general level across various populations (e.g., individuals with depression, personality disorders, or PTSD). The overall goal of this paper is to outline the details of, and support for, an experiential avoidance-based conceptualization of DSH, in the hope of prompting further research on DSH and its treatment. Before discussing the EAM, however, it is important to further clarify the precise definition of DSH on which this model is based.

In addition to excluding the repetitive and severe self-injurious behaviors occurring among cognitively or developmentally disabled and psychotic individuals, this paper focuses exclusively on self-injurious behavior that occurs in the *absence* of any intent to die. That is, we define DSH as

**THE EXPERIENTIAL AVOIDANCE MODEL (EAM) OF DELIBERATE SELF-HARM**

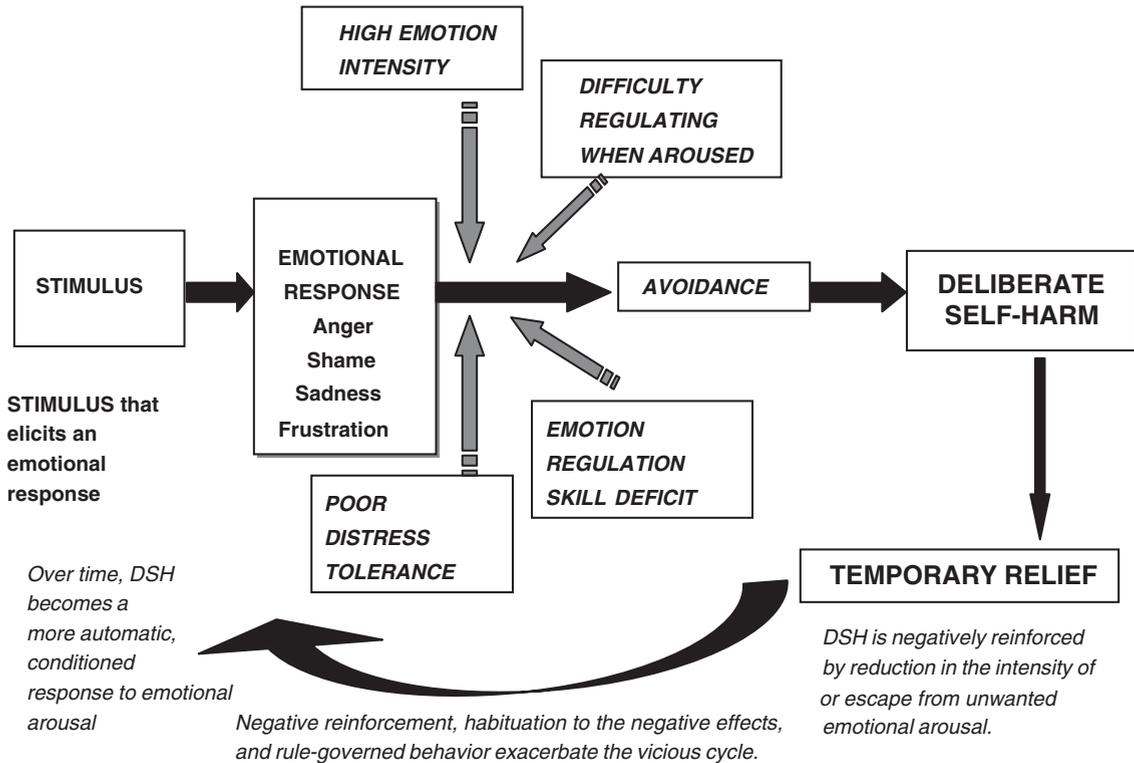


Fig. 1. Graphic depiction of the Experiential Avoidance Model (EAM) of deliberate self-harm (DSH).

a category of self-injurious behaviors subsumed under the broader category of *parasuicidal behavior*. Parasuicidal behavior includes any deliberate destruction of body tissue, with or without suicidal intent (Kreitman, 1977), and, as such, may involve a clear intent to die, no intent to die (i.e., DSH), or varying degrees of ambivalence about the intent to die. In contrast with suicidal behavior, DSH is a form of parasuicidal behavior that involves *no intent to die*. This is an important distinction, given evidence of differences in the functions and correlates of DSH and suicide attempts (Brown et al., 2002), as well as the fact that not everyone who engages in DSH is suicidal or has attempted suicide (Kessler, Borges, & Walters, 1999; Velamoor & Cernovsky, 1992).

**Solving the puzzle of deliberate self-harm: the experiential avoidance model**

DSH is a puzzling behavior, precisely because of its seemingly self-defeating, self-destructive nature. Although it is rather difficult to understand why people might intentionally self-inflict tissue damage, there is a striking commonality across many of the leading theories of DSH (see Suyemoto, 1998). Despite differing theoretical perspectives, these theories are bound together by

the notion that DSH somehow helps the individual escape, manage, or regulate emotions. For instance, the *affect regulation model* suggests that DSH functions to express, concretize, and/or control overwhelming emotions. Similarly, the *dissociation model* also proposes that DSH functions to regulate emotions, but suggests that it does so through an interaction with dissociative behavior. From the perspective of the *boundaries model*, intense emotional reactions to perceived abandonment threaten the boundaries of the “self,” and DSH functions to re-affirm or strengthen these boundaries. Consistent with aspects of each of these theories, one study demonstrated that the single most common reason reported by participants for engaging in DSH was to obtain emotional relief or regulate emotions (Brown et al., 2002). In this way, DSH may be conceptualized as a behavior that fits within the broader class of *experiential avoidance* behaviors.

Experiential avoidance includes any behavior that functions to avoid, or escape from, unwanted internal experiences or those external conditions that elicit them (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). These avoided experiences may include thoughts, feelings, somatic sensations, or other internal experiences that are uncomfortable or distressing. Rather than defining a particular form or topography of behavior, experiential avoidance is a broad category or class of behaviors bound together by the common function of avoiding or escaping unwanted internal experiences. As such, experiential avoidance is a class of behaviors that are maintained primarily through negative reinforcement, and may include a variety of seemingly dissimilar behaviors that serve this function, such as avoidant coping styles; thought suppression; drug or alcohol use to escape from unwanted moods; and avoidance of feared objects, places, or situations. Although we propose that DSH is primarily a behavior of *emotional* avoidance, it also may function to help individuals avoid thoughts, memories, somatic sensations, or other aversive internal experiences. Arguably, the avoidance of internal experiences other than emotions also may serve an *emotionally* avoidant function, as it is likely that internal experiences are unwanted because of the emotions associated with them. However, in order to capture all these potential forms of avoidance or escape, we refer to our theory as the Experiential Avoidance Model, or EAM.

Despite its obvious negative consequences, DSH is quite functional on a certain level, as it may be exceedingly effective at terminating unwanted emotional states. According to the EAM, DSH is maintained and strengthened through the process of escape conditioning (see Fig. 1) and powerful negative reinforcement. Essentially, an emotionally evocative event occurs, triggering an aversive emotional response. The individual experiences an urge to escape from the unpleasant state of arousal and engages in DSH, which reduces or eliminates the emotional arousal, thereby negatively reinforcing DSH. In a vicious cycle, repeated negative reinforcement trials strengthen the association between unpleasant emotional arousal and DSH, such that DSH becomes an automatic escape response. Although DSH likely has multiple determinants (Suyemoto, 1998), we propose that the role of experiential avoidance in DSH has empirical support and is a useful way to conceptualize the function of this behavior.

### **General tendency to avoid or escape from aversive emotional experiences**

As a behavioral model of DSH, the EAM proposes that experiential avoidance represents a functional response class, or a set of behaviors that serve similar functions (Nelson, 1988). The

particular response class relevant to DSH and highlighted within the EAM consists of behaviors that function to avoid or escape from unwanted emotional experiences (such as substance use, bingeing, avoidant coping, or thought suppression). Given research suggesting that the specific behaviors that comprise a response class covary (Nelson, 1988), it should follow that persons who engage in DSH will also engage in other behaviors that similarly function to avoid or escape unwanted emotions. Essentially, we propose that this response class represents a motivational–emotional *response tendency* that is particularly strong among individuals who engage in DSH. Therefore, findings that self-harming individuals have higher rates of clinical problems associated with, or general tendencies toward, avoidant or escape behavior would support this premise of the EAM.

Although few studies have examined the link between avoidance tendencies and DSH, preliminary findings provide tentative support for the presence of stronger experiential avoidance tendencies among individuals who engage in DSH. For instance, a recent study with female inmates found that thought suppression was positively associated with DSH (Chapman et al., in press). Similarly, in a recent study examining aspects of emotional responding that differentiate women with and without DSH (Gratz, 2004a), female college students with recent, repeated DSH ( $N = 22$ ) were matched to a group of female students with no history of self-harm on maltreatment status, race/ethnicity, and age. Results indicate that self-harming women reported significantly higher levels of experiential avoidance. Similarly, Gratz and Roemer (2004) found that frequency of self-harm was associated with emotional non-acceptance among male college students, a factor that likely increases the risk for emotional avoidance.

When avoidance behavior occurs pervasively and is ineffective within the current context, it may result in or exacerbate clinical disorders. Indeed, several clinical disorders are characterized by the presence of experiential avoidance behaviors, and numerous studies have underscored the link between DSH and these particular psychiatric disorders, including BPD (Dubo, Zanarini, Lewis, & Williams, 1997; Gunderson, Zanarini, & Kiesel, 1995; Schaffer, Carroll, & Abramowitz, 1982), PTSD (Briere & Gil, 1998; Cloitre, Koenen, Cohen, & Han, 2002; Zlotnick, Mattia, & Zimmerman, 1999), dissociative disorders (Briere & Gil, 1998; Coons & Milstein, 1990), and depressive disorders (for evidence on the relationship between depressive symptoms and DSH, see Dulit, Fyer, Leon, Brodsky, & Frances, 1994; Klonsky, Oltmanns, & Turkheimer, 2003; Ross & Heath, 2002; Schwartz, Cohen, Hoffman, & Meeks, 1989; Soloff, Lis, Kelly, Cornelius, & Ulrich, 1994; Turell & Armsworth, 2000; Tyler, Whitbeck, Hoyt, & Johnson, 2003).

The disorder most often associated with DSH is BPD, with studies finding that self-harm occurs among as many as 48–79% of individuals with BPD (Brodsky, Cloitre, & Dulit, 1995; Dubo et al., 1997; Dulit et al., 1994; Linehan, 1993; Zanarini, Gunderson, Frankenburg, & Chauncey, 1990; Zweig-Frank, Paris, & Guzder, 1994). According to Linehan (1993), the defining feature of BPD is emotion dysregulation, a multi-dimensional construct (see Gratz & Roemer, 2004; Linehan, 1993) that includes an unwillingness to tolerate emotional distress. Behaviors commonly associated with BPD, including DSH, are thought to function to reduce or eliminate painful emotions that cannot be tolerated. Consistent with this theory, there is increasing evidence for the role of emotional avoidance in BPD. For instance, preliminary data suggest that BPD may be associated with lower tolerance for psychological distress (see Lejuez, Daughters, Wolf, Kosson, & Lynch, 2004), but not physical pain (Bohus, Limberger, & Ebner, 2000; McCown, 1993). Moreover, there is evidence that BPD (or BP traits) may be associated with the greater use of

avoidance/escape coping strategies (see Bijttebier & Vertommen, 1999; Chapman et al., in press; Kruegelbach, McCormick, Schulz, & Grueneich, 1993).

DSH is also reported at lifetime rates of greater than 50% among samples with PTSD (Cloitre et al., 2002), a disorder also characterized by high levels of experiential avoidance. In fact, avoidance of emotional material is thought to be a central factor in the development and maintenance of PTSD (for a review of the theoretical and empirical literature on emotional avoidance in PTSD, see Salters, Tull, & Roemer, 2004), and a growing number of self-report studies have found a relationship between experiential avoidance and poorer post-traumatic outcomes (Bryant & Harvey, 1995; Clohessy & Ehlers, 1999; Nightingale & Williams, 2000; Marx & Sloan, 2002), including greater PTSD symptom severity (Tull, Gratz, Salters, & Roemer, 2004). Similarly, researchers have suggested that dissociation may function to avoid intolerable emotions, thoughts, and traumatic memories (e.g., Foa & Riggs, 1995; van der Kolk, Perry, & Herman, 1991; van der Kolk, 1996; Wagner & Linehan, 1998). Preliminary empirical support for this conceptualization of dissociation is provided by findings indicating that dissociation is associated with experiential avoidance (Gratz, 2004b).

Finally, DSH is often associated with the presence of depressive symptoms (see Dulit et al., 1994; Klonsky et al., 2003; Ross & Heath, 2002; Schwartz et al., 1989; Soloff et al., 1994; Turell & Armstrong, 2000; Tyler et al., 2003). As with BPD and PTSD, depression also is thought to be associated with experiential avoidance. In particular, some researchers have suggested that thought suppression (one form of experiential avoidance) accompanies and exacerbates the experience of depression (see Wenzlaff & Bates, 1998). Moreover, recent studies have found depressive symptoms to be associated with experiential avoidance and the non-acceptance of emotional responses (Tull et al., 2004; Wegner & Zanakos, 1994).

#### *Factors that may underlie heightened experiential avoidance tendencies*

Several factors may be associated with the heightened experiential avoidance tendencies found among persons who engage in DSH. For instance, it is possible that the tendency to engage in avoidance behavior is a hard-wired emotional response tendency, or an action pattern that occurs in response to particular emotional experiences. Some researchers have posed that the foundations of emotional response tendencies consist of biological systems that have been shaped by evolution over several millennia (Gross, 1998; LeDoux, 2002). For instance, Lang and colleagues have organized these “tendencies” into two emotion motivational response systems: (a) the *defensive system*, activated by threat with a basic behavioral repertoire of withdrawal, escape, and attack, and (b) the *appetitive system*, activated by contexts related to sustenance, procreation, and nurturance, and associated with behaviors such as approach, ingestion, and caregiving (Lane et al., 1997). Similarly, Gray (1987) has defined two temperament-based motivational systems that are activated by differing stimuli: the behavioral activation system (BAS), activated by novel or rewarding stimuli and involving active approach behavior, and the behavioral inhibition system (BIS), activated by aversive stimuli or punishment and involving avoidance behavior. Cloninger (1987) also has proposed the presence of similar behavioral tendencies, with harm avoidance (HA) being the trait most closely linked with avoidance behavior. Although HA and BIS are associated more specifically with passive avoidance behavior in the presence of anxiety, fear, or novel stimuli, it is possible that these

behavioral systems form the foundation for enhanced susceptibility to experiential avoidance behaviors among persons who engage in DSH.

Alternatively, higher levels of impulsivity or novelty seeking (a temperament characteristic linked with susceptibility to reward-driven behavior) may be associated with a greater likelihood of experiential avoidance. For instance, a recent study of the association between temperament traits and behavioral disinhibition on a passive avoidance learning task found that higher levels of novelty seeking were associated with less time spent reflecting on punishing consequences (Farmer et al., 2003), and that lower reflection on punishment was associated with a larger number of commission errors (most commonly associated with impulsive responding) (see also Chapman, Mayer, Specht, Farmer, & Field, 2003; Gremore, Chapman, & Farmer, in press). Given that one proposed dimension of impulsivity is lack of premeditation (defined as the individual's ability to reflect on the consequences of a possible action, as well as to choose between smaller, more immediate rewards and larger but delayed rewards; Whiteside & Lynam, 2001), this characteristic also may increase the risk for experiential avoidance. In fact, another aspect of impulsivity, *urgency* (i.e., the compromised ability to resist impulses that are driven by negative affect; Whiteside & Lynam, 2001), has been found to be associated with bulimic symptoms (Fischer, Smith, & Anderson, 2003), which may also serve an experientially avoidant function (e.g., Deaver, Miltenberger, Smyth, Meidinger, & Crosby, 2003). Despite these suggestive findings, however, future research is needed to examine more directly the link between DSH, behavioral systems of inhibition and HA, and temperament characteristics of novelty seeking and impulsivity.

An additional factor that may underlie heightened experiential avoidance tendencies among individuals who engage in DSH is heightened levels of aversive physiological arousal to emotionally evocative events. Because individuals with high levels of emotional intensity must regulate greater levels of arousal (Flett, Blankstein, & Obertynski, 1996), and greater arousal is associated with greater difficulty regulating emotions (Eisenberg, Cumberland, & Spinrad, 1998), individuals with heightened emotional intensity may experience their emotions as overwhelming. This may result in a tendency to avoid these emotions or the internal experiences that contribute to these emotions. Indeed, previous research has indicated that individuals who are emotionally intense are more likely to use emotional avoidance and inhibition to cope with strong emotional experiences (see Lynch et al., 2001). Moreover, studies have found a significant association between emotional intensity/reactivity and experiential avoidance (Gratz, Jakupcak, & Roemer, 2001). Although emotional intensity is not a *sufficient* factor for experiential avoidance or DSH, individuals with stronger emotional intensity are likely at greater risk to use DSH as a means to escape their emotions.

Along with emotional intensity, specific types of emotional experiences may be more likely to trigger experiential avoidance and DSH. For instance, Baumeister has posited that aversive states of *self-awareness* are particularly conducive to a shift toward the narrowing of attention to the present or to proximal goals (i.e., relief from emotional pain) and difficulty processing information (Tice, Bratslavsky, & Baumeister, 2001; Baumeister, 2003; Vallacher & Wegner, 1989). Thus, it is possible that persons who engage in DSH are particularly prone to emotional experiences characterized by unpleasant states of self-awareness. Supporting this possibility, recent studies have established a link between parasuicidal behavior and the emotion of *shame* (Brown et al., 2002), a highly painful, self-focused emotion characterized by disruption in

behavior and confusion in thought (Lewis, Alessandri, & Sullivan, 1992). The action tendencies associated with shame include urges to hide, withdraw, disappear, or avoid thinking about aspects of the shameful behavior. By curtailing meaningful thought or problem solving, these action tendencies may increase the likelihood of engaging in DSH.

Alternatively, individuals who engage in DSH may not actually have heightened emotional arousal, but rather a lower tolerance for emotional arousal (i.e., lower *distress tolerance*). Low tolerance for emotional distress would be expected to increase the urge to eliminate the emotional arousal, thus increasing the likelihood of engaging in some form of experiential avoidance behavior, such as DSH. Distress tolerance is likely influenced by the degree to which individuals experience their emotional arousal as aversive or unpleasant, regardless of the actual level or intensity of the arousal. For instance, results of psychophysiological studies suggest that individuals with BPD do not necessarily evidence greater physiological reactivity to emotional stimuli than normal controls; rather, they *subjectively report* greater affect intensity (Herpertz, Kunert, Schwenger, & Sass, 1999; Herpertz et al., 2000). The subjective experience of greater and more aversive emotional arousal likely makes it considerably more difficult to tolerate such emotional arousal, leading to attempts to avoid it.

Another key component in the development of maladaptive experiential avoidance behaviors may be the failure to implement more skillful behaviors in response to emotional arousal. These skillful responses may include (a) reducing intense physiological arousal associated with the emotion; (b) turning attention away from emotional stimuli; (c) inhibiting impulsive, mood-driven behavior, and (d) engaging in behavior oriented toward achieving non-mood-dependent goals (Gottman & Katz, 1989). Individuals with limited access to effective strategies to modulate emotional arousal are more likely to seek to avoid these emotions entirely, and therefore may be at greater risk for behaviors such as DSH (especially when the emotions they are trying to avoid are experienced as intense). That is, when individuals with few effective emotion regulation strategies are faced with the need to regulate emotions experienced as intense, they may be more likely to engage in potentially maladaptive strategies, such as experiential avoidance. In fact, Gratz and Roemer (2002) found that limited access to emotion regulation strategies perceived as effective mediated the relationship between childhood emotional neglect and experiential avoidance among female college students.

Alternatively, an individual may have the requisite emotion regulation skills but fail to implement them when emotionally aroused. Similar to Baumeister's (1990) escape theory of suicide, individuals who engage in DSH may experience a breakdown in their cognitive or information processing systems under conditions of intense emotional arousal. Increasingly, basic research has indicated that emotions constitute full system responses, consisting of physiological, expressive, cognitive, and behavioral components (Ekman & Davidson, 2004). Studies have found that cognition and information processing tend to narrow under conditions of intense emotional arousal, with resulting difficulties in problem solving (Gellatly & Meyer, 1992; Keinan, 1987). Having difficulty thinking, planning, or implementing more functional coping strategies, individuals may resort to quick, easily executable strategies to regulate emotions, such as DSH. Moreover, for individuals high in impulsivity, this tendency would likely be exaggerated, as impulsivity may heighten the tendency to choose destructive coping strategies, rather than more adaptive strategies that take longer to alleviate distress.

## The function of DSH: escape or relief from emotions

The EAM conceptualizes DSH as a behavior that leads to the reduction or elimination of unwanted emotional responses, particularly the physiological aspects of the emotional response. Through a vicious cycle, temporary relief from intense emotional responding reinforces and strengthens DSH, making this behavior considerably more likely when the individual experiences similar conditions in the future. Converging findings from a variety of self-report and psychophysiological studies provide support for the premise that DSH is associated with relief or escape from emotional experiences.

### *Self-report studies of emotional antecedents and consequences of DSH*

Individuals with DSH report high levels of aversive internal states both before DSH and in general (e.g., Michel, Valach, & Waeber, 1994), including depressive affect (e.g., Simeon et al., 1992), anxiety (Simeon et al., 1992; Wilkins & Coid, 1991), depersonalization or emptiness (e.g., Simpson, 1975), and mixed anxiety and depression (e.g., Fulwiler et al., 1997). They also report high levels of hostility toward themselves and others (e.g., Brittlebank et al., 1990; Simeon et al., 1992; Hillbrand, 1995), although it is noteworthy that DSH is more often attributed to anger toward the self than anger toward others (Bennum & Phil, 1983). Studies suggest that 80–94% of individuals report feeling better after DSH (Bennum & Phil, 1983; Coid, 1993), with relief provided from unbearable anxiety and tension (and accompanying dissociation and emptiness) being in particular (e.g., Favazza & Conterio, 1989; Fulwiler et al., 1997; Gardner & Gardner, 1975; Kemperman, Russ, & Shearin, 1997; Simpson, 1975; Wilkins & Coid, 1991). Similarly, a recent study assessed female inmates' emotional experiences prior to and following their most recent episodes of DSH, using a standard list of emotion words (anger, sadness, anxiety, guilt, tension, boredom, indifference, relief, and calmness; Chapman, 2004). All participants reported having initiated DSH during a period of negative emotion: anger (45%), sadness (10%), anxiety (16%), guilt (6%), tension (10%), and boredom (13%). Supporting the premise that DSH is associated with relief, the largest percentage of individuals reported that they felt *relieved* immediately following engagement in DSH (25.8%), followed by calm (16.1%), sad (12.9%), indifferent (12.9%), guilty (9.7%), anxious (9.7%), angry (6.5%), and tense (6.5%). However, interesting differences emerged between BPD and non-BPD participants, with BPD participants more likely to report feeling relieved (37.5% vs. 13.3%) after DSH. Conversely, non-BPD persons were more likely to report negative emotional consequences of self-harm, particularly anxiety (20% vs. 0%). These results suggest that relief from negative emotions is a commonly reported consequence of DSH, and that some groups of individuals (i.e., individuals with BPD) are more likely to experience this relief.

### *Self-report studies on the perceived function of DSH*

Although it is likely that DSH serves multiple functions simultaneously (Suyemoto, 1998), one of the most consistent findings in studies on the self-reported reasons for DSH is the primacy of reasons related to avoiding, eliminating, or escaping internal experiences. For instance, Favazza and Conterio (1989) examined the self-reported functions of DSH among a community sample of

240 self-selected females with a history of this behavior. Among these participants, DSH was reported to facilitate relaxation, control racing thoughts, self-punish, and relieve feelings of depression, loneliness, and derealization. [Briere and Gil \(1998\)](#) also examined the functions of DSH among a group of self-identified (predominantly female) individuals with a history of this behavior. These individuals were asked to select the functions of their DSH from a list of reasons commonly provided by self-harming clients for this behavior. The participants selected a wide variety of functions for their DSH, including self-punishment, distraction and relief from painful feelings, management of stress, reduction of tension, release of anger, and enhancement of feelings of self-control (each endorsed by more than 70% of the sample). A factor analysis performed on the reasons for DSH cited by more than 20% of the participants resulted in nine factors, leading the researchers to conclude that DSH may function to: (a) decrease dissociative symptoms, (b) prevent flashbacks and upsetting memories, (c) reduce stress and tension, (d) express distressing emotions, (e) provide a sense of safety and protection, (f) reduce anger, (g) punish the individual, (h) show others that the individual needs help, and (i) protect the individual from hurting others.

Similarly, a recent study of the reasons for both DSH and suicidal behaviors among women with BPD found that the vast majority of participants (96%) endorsed reasons for DSH related to emotional relief ([Brown et al., 2002](#)). Other reasons for DSH endorsed by more than 50% of the women included to get away or escape (52%), feeling generation (54%), anger expression (63%), self-punishment (63%), and interpersonal influence (61%). Moreover, reasons of feeling generation, distraction, and anger expression were endorsed more frequently for DSH than for suicidal behaviors. Based on these findings, the authors concluded that emotional relief may be a primary function of DSH.

Results of a small qualitative study that used open-ended interviews to assess the functions of DSH ([Gratz, 2000](#)) are also consistent with these findings. Specifically, [Gratz \(2000\)](#) found that the most frequently described function of DSH was to relieve unwanted feelings, reported by 76% of the participants. These participants reported that DSH relieved feelings of stress, anger, frustration, sadness, emotional upset, tension, anxiety, grief, emotional pain, and being overwhelmed. Participants also reported that DSH externalized emotional pain, thereby making the pain more tangible, less abstract, and easier to understand. Participants also noted that DSH provided an escape, a way to forget about worries and fears, and a way to divert attention from painful internal experiences. According to participants' reports, DSH also functioned to express feelings of self-hatred, self-punish, provide a sense of control, and prove something to the individuals (e.g., that they were capable of doing something or tough enough to endure pain).

Recent studies of DSH among adolescents report consistent findings. For example, [Rodham, Hawton, and Evans \(2004\)](#) found that among a sample of adolescents in England, the most frequently endorsed reason for DSH was to get relief from a "terrible" state of mind, reported by 73% of the sample. Moreover, in response to an open-ended question assessing reasons for DSH, the most frequently reported reasons were depression and feeling "horrible" about oneself (reported by 18% of the sample), the build-up of pressure until it was no longer tolerable (reported by 10.9% of the sample), and escape from having to think about one's problems (reported by 8.3% of the sample). Similarly, [Penn, Esposito, Schaeffer, Fritz, and Spirito \(2003\)](#) found that among a sample of adolescents in a juvenile correctional facility, the most frequently endorsed reason for engaging in DSH was to stop bad feelings (65%), followed by to feel something (60%) and to self-punish (60%).

Overall, results of these studies suggest that DSH is often used to avoid or eliminate unwanted internal experiences, including intolerable emotions and distressing thoughts or memories. Even the self-reported function of self-punishment may be conceptualized as an attempt to avoid shame or unwanted negative beliefs about the self, as punishing the self may alleviate feelings of guilt or shame. It also is noteworthy that the results of these studies are consistent with clinical observations and case studies, which document similar functions of DSH among self-harming clients (Coons & Milstein, 1990; Greenspan & Samuel, 1989; Kennerley, 1996; Lyons, 1991; Michel et al., 1994; Shapiro & Flushing, 1987).

### *Psychophysiological studies relevant to the function of DSH*

Although limited in number, experimental studies on the physiological aspects of emotional responding provide additional support for the theory that DSH functions as an avoidance/escape behavior. In an interesting single-case study, Sachsse, von der Heyde, and Huether (2002) recently examined the relationship between cortisol levels and self-mutilation. Levels of cortisol (a stress hormone) generally index the activation of the hypothalamic-pituitary axis (HPA-axis), a neural system that has been implicated as a biological vulnerability factor for suicidal behavior (Lieb et al., 2004; van Heeringen, Audenaert, Van de Wiele, & Verstraete, 2000). Hyperactivity in the HPA-axis may occur in response to chronic stressors, accounting for some of the untoward neurological effects of chronic stress (see, e.g., Duman, Malberg, Nakagawa, & D'Sa, 2000). Specifically, Sachsse et al. (2002) used ambulatory monitoring methods to examine nocturnal cortisol levels, subjective emotional experiences, and episodes of DSH over an 86-day period in a self-harming woman. The authors reported that high cortisol levels corresponded with high ratings of negative emotions and preceded episodes of DSH. Following DSH, cortisol levels dropped dramatically and stayed low for the next few days.

Studies have also begun to use analogue methods to examine the function of DSH. For instance, Haines et al. (1995) examined responses (both physiological and subjective) to personalized DSH imagery scripts among male prisoners with a history of DSH. Consistent with the EAM, self-harming prisoners evidenced a decrease in physiological arousal and self-reported negative emotions in response to the DSH imagery. These decreases were not observed for imagery associated with an emotionally neutral or an accidental injury event. Conversely, when male college students with no history of DSH were exposed to generic DSH imagery scripts, they evidenced *heightened* physiological arousal, and reported no decrease in negative emotions in response to the scripts. On the other hand, analyses of differences in patterns of response to three *control* imagery scripts among self-harming male prisoners, male prisoners with no history of DSH, and college students with no history of DSH or incarceration indicated minimal between-group differences.

Moreover, a recent study (Shaw-Welch, Kuo, Sylvers, Chittams, & Linehan, 2003) modeled after Haines et al. (1995) found similar results with a sample of parasuicidal women with BPD. Participants were exposed to separate imagery scripts consisting of recent episodes of DSH, accidental self-injury, and neutral scripts. Participants evidenced a significant decrease in measures of sympathetic arousal in response to the DSH scripts. With the accidental injury scripts, participants actually showed a significant increase in sympathetic arousal. Together with the self-report studies reviewed above, these studies provide mounting evidence that DSH is associated with reductions in emotional arousal.

## Mechanisms of emotional escape in DSH

If, as we propose in the EAM, DSH is an experiential avoidance strategy, an important question emerges: Why do people experience relief after injuring themselves? Although very few empirical studies have examined the potential mechanisms underlying the emotionally avoidant function of DSH, several theories have been posed. These theories include the opioid hypothesis, the distraction hypothesis, and the self-punishment hypothesis.

### *The opioid hypothesis*

As the leading biological theory on the mechanism of emotional escape in DSH, the opioid hypothesis posits that DSH elicits endogenous opioids, which create analgesia and relieve emotional distress (Coid, Allolio, & Rees, 1983; Russ, 1992; Roth, Ostroff, & Hoffman, 1996). Some studies that have examined this hypothesis have found elevated levels of opioid peptides in persons who engage in DSH (Coid et al., 1983); others have found that the administration of opiate receptor agonists (such as naltrexone) results in reduced DSH (Roth et al., 1996). However, in his review of this literature, Russ (1992) pointed out that the results of these studies are inconsistent, possibly due to the large variety of opioid peptides. In addition, the literature in this area consists largely of case studies and open trials and, to our knowledge, there are no published controlled trials on this topic. Moreover, generally elevated levels of opioid peptides are neither necessary nor sufficient to support or refute the opioid hypothesis. The opioid hypothesis suggests that individuals experience increased endogenous opioid activity *when they self-harm*, not that they necessarily have elevated levels of opioid peptides in general. However, there is currently no research supporting the notion that opioid levels are elevated *after* DSH.

An alternative version of the opioid hypothesis suggests that individuals who engage in DSH experience increased activity in the opiate system in response to stress (see Saxe, Chawla, & van der Kolk, 2002), which is thought to lead to an uncomfortable state of dissociation and numbness. In order to terminate this aversive state, individuals engage in DSH, the physical pain of which essentially awakens the person from the dissociative state. According to this model, DSH provides physical stimulation that interferes with dissociation (Simpson, 1975). However, studies have yet to find increased opioid release in response to stress among persons who engage in DSH. Clearly, more studies are needed to clarify the relationship of opioids to DSH.

### *Distraction*

Rather than being provided through opiate-induced analgesia or the termination of an aversive dissociative state, an alternative hypothesis suggests that the relief from DSH is provided through distraction from painful emotional arousal. That is, the distraction hypothesis suggests that DSH provides physical stimulation (i.e., pain) sufficiently compelling to divert the individual's attention from painful emotional arousal. According to some researchers, a major strategy used to regulate emotions involves redirecting attention away from the emotionally evocative event (Gottman & Katz, 1989; Gross, 1998). However, Linehan (1993) has proposed that individuals with BPD have considerable difficulty disengaging their attentional focus from emotional stimuli when they are

emotionally aroused, resulting in the continued re-firing of the unwanted emotional response. DSH may serve to shift attentional focus away from emotional pain and toward physical pain.

Although there is some preliminary empirical support for the distraction hypothesis, the majority of this support comes from the aforementioned studies on the self-reported reasons for DSH, some of which have found distraction from overwhelming or intolerable internal experiences to be a primary function of DSH (Briere & Gil, 1998; Gratz, 2000). However, findings from other studies provide evidence in refutation of this hypothesis. For example, Brown et al. (2002) found that individuals with BPD reported distraction (25%) less often than other reasons for DSH, such as self-punishment (67%) and anger expression (67%). In addition, a significant proportion of individuals who engage in DSH do not experience pain (Russ, 1992; Russ et al., 1992). In the absence of physical pain, it is unclear how DSH would be sufficiently distracting to divert an individual's attention away from intense emotional pain.

Alternatively, DSH may function to distract the individual from unpleasant states of dissociation or numbness by prompting an orienting response (OR). The orienting reflex (Pavlov, 1927) is the body's first response to a novel stimulus, functioning to prepare the neural systems for sensory analysis in order to facilitate central processing of stimuli (Sokolov, 1963; Graham, 1979; Cook & Turpin, 1997). The OR *opens* or *awakens* the individual to her or his environment and increases cortical activity (as evidenced by studies demonstrating increased cerebral blood flow following novel stimuli; see Tulving, Markowitsch, Kapur, Habib, & Houle, 1994). Therefore, the novel aspect of physical pain, or of seeing blood or injury, may elicit an OR that jars the individual out of a dissociative state. It should be noted that the OR would be expected to decrease as the stimuli associated with DSH become less novel. Thus far, we are not aware of any published studies that have examined the OR in relation to DSH, although this would be an interesting direction for future research.

### *The self-punishment hypothesis*

The self-punishment hypothesis posits that DSH produces reductions in emotional arousal through a process called *self-verification* (Swann, Hixon, Stein-Seroussi, & Gilbert, 1990). Self-punishment is a broad category of behavior, including self-criticism, overt self-injury, self-deprivation, and other “deserved” negative consequences to perceived transgressions. Self-verification theory (Swann et al., 1990) states that people behave in ways that are consistent with their basic beliefs about themselves, or self-concepts (Aronson & Mette, 1968). When these basic beliefs are disconfirmed, people experience an aversive state of tension (“disintegration anxiety”), characterized by high emotional arousal and a feeling of being out of control. This state of tension is thought to arise, in part, because the fundamental human need to make sense of the world has been thwarted. Similarly, cognitive dissonance theory postulates that inconsistencies between important cognitions (e.g., “I deserve to be punished” and “I have not been punished”) create aversive affect, or dissonance (Festinger, 1978). As a result, individuals may engage in various behaviors to restore both their sense of control and their experience of the world as predictable. When their basic beliefs about themselves are confirmed (e.g., after “deserved” punishment), emotional arousal diminishes.

When individuals who engage in DSH hold the belief that they are bad or have committed some serious transgression, DSH may reduce emotional arousal by confirming negative self-concepts.

In support of this hypothesis, self-punishment is a common reason reported for engaging in DSH (Brown et al., 2002; Gratz, 2000; Penn et al., 2003). Bandura (1977) offered the first explanation of anxiety relief following self-punishment, suggesting that self-punishment and self-destructive behaviors are maintained by their capacity to (a) alleviate distress associated with negative thoughts about oneself, and (b) lessen external punishment. Within this framework of social learning theory, individuals may develop a conditioned association between punishment by others and emotional relief, particularly including relief from guilt or shame. This association may subsequently generalize to self-inflicted punishment. Over the course of socialization, the chain of behavior involving (perceived) transgression, distress, self-punishment, and relief is repeatedly experienced and strengthened.

Similarly, DSH as self-punishment may relieve distress by averting or reducing interpersonal conflict or external punishment following perceived transgressions (i.e., escape conditioning). That is, DSH may be followed by (temporary) changes in the social environment, such as reduced demands or the termination of others' unpleasant behaviors. For instance, abusive family members may be less likely to deprecate or punish a child who already has preemptively engaged in self-deprecation or self-punishment. Indeed, studies have shown that people tend to reduce aversive behavior or increase affiliative behavior (e.g., reassurance) toward individuals who exhibit shame or self-deprecation (at least in the short-term; cf. Coyne, 1976; Powers & Zuroff, 1988). In addition, self-punitive behavior may develop, in part, because of its self-protective and stress-reducing functions. For instance, research suggests that adults given the opportunity to avoid painful shocks by giving themselves less intense shocks show increased self-punitive responses as well as less emotional distress (Stone & Hokanson, 1969). Along these lines, when an individual escapes or avoids the threat of aversive behaviors from others by engaging in DSH, she or he may experience a reduction in anxiety.

### **The vicious cycle of experiential avoidance and DSH**

To recap the EAM, DSH is a behavior that is negatively reinforced through the reduction of unwanted internal experiences, particularly emotional responses. According to the EAM, individuals who engage in DSH have strong experiential avoidance repertoires or response tendencies, possibly stemming from more intense emotional responses, poor distress tolerance, deficits in emotion regulation skills, and/or difficulties implementing alternative coping strategies when emotionally aroused. We propose that DSH persists in a vicious, self-perpetuating cycle, primarily related to four factors: (a) the paradoxical effects of experiential avoidance, (b) a failure to extinguish the aversive emotional response, (c) rule-governed behavior, and (d) the habituation of factors that normally would constrain this behavior.

#### *Paradoxical effects of experiential avoidance*

The chronic use of experiential avoidance strategies may have paradoxical effects, engendering heightened levels of distress, and thereby further increasing the likelihood of DSH. Research on thought suppression and emotional avoidance suggests that the use of these strategies may increase distress (Craske, Miller, Rotunda, & Barlow, 1990; Gross & Levenson, 1997; Wegner &

Gold, 1995). For instance, attempting to suppress unwanted thoughts increases the frequency of such thoughts, particularly when people are under stress or engaging in a concurrent effortful task (see Abramowitz, Tolin, & Street, 2001 for a meta-analytic review). In addition, Lynch et al. (2001) found that experiential avoidance mediated the association between emotional intensity and self-reported depression and hopelessness. According to the EAM, the act of avoiding or escaping emotions through DSH increases the likelihood that the individual will experience a rebound effect, consisting of more frequent or more intense experiences of the avoided emotions. This rebound then triggers further DSH, and the cycle repeats itself in a dynamic fashion.

#### *Failure of extinction and emotional processing*

In addition to potentially causing a rebound effect, the chronic use of experiential avoidance strategies such as DSH also may prevent the extinction of unwanted emotions. Historically rooted in research and theory on classical conditioning, modern approaches to treating emotional disorders (e.g., Barlow, 1988; Foa & Kozak, 1986) often utilize interventions geared toward exposing the individual to emotionally evocative stimuli, while blocking the avoidance response. Underlying these approaches is the assumption that repeated exposure to the stimulus that elicits a learned emotional response (in the absence of the feared outcomes) will weaken that emotional response. However, the use of avoidance and escape behavior prevents this process from occurring. For example, a socially phobic individual who avoids public speaking situations fails to learn that public speaking is (for the most part) non-threatening. In classical conditioning terms, the conditioned response (CR) of anxiety/fear is maintained through avoidance of the conditioned stimulus (CS) of public speaking. It is quite likely that *experientially* avoidant behaviors such as DSH operate in a similar manner. For example, the use of DSH to avoid an unwanted primary emotional response (CS) will preclude the opportunity to learn that this emotional response is non-threatening; thus, the CR (e.g., a secondary emotional response of fear) will likely be maintained through the repeated avoidance of and/or escape from the primary emotional response (although, see Bouton, 1993 for a review of additional processes that may influence or account for extinction).

#### *Rule governed behavior*

In addition to its powerful, immediate consequences, part of the persistence of DSH can likely be explained by the principle of *rule-governed behavior*. Hayes et al. (1996) have proposed that experiential avoidance often constitutes rule-governed behavior, or behavior that occurs in response to a verbal rule that specifies a relationship between a given behavior (i.e., cutting) and a consequence (feeling better). For example, either through the direct experience of DSH leading to relief, or through hearing about or observing others' experiences of relief following DSH, an individual may adopt the verbal rule, "If I cut, I will feel better." Within this framework, that individual may then choose to engage in DSH in response to this verbal rule, despite the fact that DSH is associated with negative long-term consequences, including the potential for *increased* distress. Although rule-governed behavior is quite common and often involves relatively benign or adaptive rules (e.g., "If I practice yoga daily, I will feel more relaxed"), it can dramatically limit

flexible responding, and, like the avoidance of CS discussed above, can interfere with new learning (e.g., that an avoided internal experience is not actually dangerous). For instance, research suggests that rule-governed behavior may reduce an individual's sensitivity to, and ability to learn from, actual contingencies operating in the environment (Hayes, Kohlenberg, & Melancon, 1989). Thus, in the case of DSH, the rule specifying a link between cutting and relief may reduce the likelihood that the individual will learn from the unpleasant consequences of cutting (such as social disapproval, visible scarring, shame, or increased distress).

Moreover, verbal rules about the relieving consequences of DSH may interact with the effects of immediate emotional distress to further increase the likelihood of DSH. Baumeister (1997) has proposed that emotional distress engenders a focus on the goal of obtaining immediate relief. Further, when people are distressed *and* believe that a self-defeating act will produce such relief, they are more likely to perform it (Baumeister, 1997). In fact, a recent study found that when people believe that a behavior will reduce their distress in the short-term, they are more likely to use it when they are distressed—even when such behavior is clearly self-defeating, such as eating fattening snacks or procrastinating (Tice et al., 2001).

#### *Habituation of reactions to negative consequences over repeated trials*

Further exacerbating the vicious cycle of DSH, the very act of DSH may, over time, become linked with fewer punishing consequences. In his model of the trajectory of suicidal behavior, Joiner (2002) proposes that repeated suicidal behavior causes habituation to the fear, pain, or negative social connotations associated with the behavior. Moreover, based on opponent process theory (Solomon, 1980), Joiner proposes that as these negative associations diminish, the opposite effect (or, opponent process) is enhanced; thus, the negatively reinforcing effects of suicidal behaviors tend to strengthen over time. Although this theory has been applied only to suicidal individuals, a similar process may occur among individuals who engage in DSH. Research on the link between DSH and suicide attempts (see van Egmond & Diekstra, 1989) supports this possibility.

### **General summary and discussion**

The EAM is a model that is grounded in research on emotions and DSH, and that may serve as a conceptual guide for further research on DSH and its treatment. The EAM describes the primary function of DSH as the avoidance of, or escape from, unwanted or aversive states of emotional arousal. A growing number of studies provide support for the conceptualization of DSH as an experiential avoidance behavior. Moreover, researchers are beginning to delineate the potential mechanisms by which DSH may provide escape from emotional arousal, suggesting that DSH may result in the release of endogenous opioids, distract the individual from unwanted emotional arousal, or serve a self-punishment function that reduces arousal. The EAM also delineates several additional factors (e.g., emotional intensity, deficits in emotion regulation skills, distress intolerance) that may contribute more generally to experiential avoidance, thereby increasing the likelihood of DSH. The EAM holds promise in providing direction for future studies and the development of clinical interventions.

In terms of future research, several important questions require empirical examination. Although several studies (both self-report and experimental) have supported the premise that DSH leads to emotional relief, we know of no published study that has examined the emotional precipitants and consequences of DSH in participants' natural environments. In addition, it is not clear whether certain emotional responses are especially likely to precede or be relieved by DSH, and whether these emotional responses differ depending on the presence of clinical features (e.g., BPD versus non-BPD) or other individual characteristics. Relevant to the self-punishment hypothesis, it would be interesting to examine whether certain types of DSH are more likely to occur in certain interpersonal environments. Moreover, research is needed to examine the specific factors that result in the development of DSH, as opposed to less destructive experiential avoidance behaviors. Although research suggests factors that may increase experiential avoidance in general, none of these factors is specific to DSH. Research examining the factors that lead individuals specifically to engage in DSH (rather than another form of experiential avoidance) would facilitate the development of more effective treatments.

One particularly promising methodology for examining the function of DSH is ambulatory monitoring (Fahrenberg & Myrtek, 1996), whereby a participant uses self-monitoring devices (e.g., hand-held computers) in her or his natural environment in order to record emotions, thoughts, and/or contextual events in real-time at various points throughout the day (thereby addressing the bias associated with retrospective self-reports of experiences). When used in conjunction with ambulatory monitoring of physiological emotional arousal, this methodology has considerable potential to elucidate the environmental precipitating factors and specific emotions associated with DSH. Furthermore, the continued use of in-vivo imaginal exposure methods, combined with the assessment of physiological arousal, subjective emotional responses, neuronal function, and/or neurochemicals may help elucidate the mechanisms underlying the emotionally avoidant function of DSH.

The EAM also has several important clinical implications. For instance, this model highlights the utility of teaching self-harming individuals skills for tolerating or regulating unwanted emotional arousal. Dialectical Behavior Therapy (DBT) for BPD includes several skills focused primarily on enhancing distress tolerance and emotion regulation (Linehan, 1993), and recent short-term interventions developed for DSH among individuals with and without BPD have incorporated elements of DBT with elements from other behavior therapies (see Evans, 2000; Gratz & Gunderson, *in press*). Other clinical interventions might seek to reduce the reinforcing qualities of DSH, or to apply other competing contingencies.

In terms of reducing emotional arousal to emotionally evocative stimuli, treatment might involve interventions geared toward exposure and response prevention. Repeated exposure to the CS that elicits an emotional response should reduce the likelihood that the CS will elicit the CR. Recently, learning theorists have proposed that repeated non-reinforced exposure to the CS does not weaken the initial association of the unconditioned stimulus (US) and the CS, but rather, *masks* the CS–US relationship; thus, extinction training establishes new CS associations (Robbins, 1990). In this framework, behavioral exposure involves learning alternative responses to stimuli that elicit unwanted internal experiences. As previously mentioned, the EAM suggests that one of the factors contributing to the self-perpetuating cycle of DSH and experiential avoidance is the way in which DSH interferes with the learning of new, alternative responses to stimuli. Therefore, interventions that facilitate the learning of these new responses could help break this self-

perpetuating cycle. Indeed, one of the key proposed mechanisms of change in DBT is behavioral exposure and acting opposite to emotion-related action urges (Lynch, Chapman, Rosenthal, Kuo, & Linehan, in press). Future research might explore the use of exposure paradigms to reduce emotional arousal in individuals who engage in DSH, and examine whether a reduction in arousal is linked with reduced urges to engage in DSH.

Another direction for treatment is to weaken the patient's reliance on experiential avoidance strategies in response to emotional arousal. As noted above, the over-use of experiential avoidance behaviors (effective for short-term relief) is likely to have paradoxical consequences in the long-term, ultimately resulting in increased distress. If DSH exists within the broader response class of experiential avoidance behaviors, decreasing the habitual use of these behaviors while simultaneously increasing emotional willingness and acceptance may break the self-perpetuating cycle of emotional avoidance and DSH. Of course, this approach necessitates the careful assessment of the presence of other experiential avoidance behaviors (such as binge eating and substance use), so that DSH is not simply replaced with another potentially harmful behavior that serves a similar emotionally avoidant function.

Several more recent treatment approaches include interventions specifically designed to reduce experiential avoidance. In particular, Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) reduces experiential avoidance by targeting and reducing rule-governed behavior, increasing emotional willingness, teaching the paradoxical consequences of attempts to control/avoid emotions, and increasing valued action. Pilot data on a new, ACT-consistent group treatment for DSH suggests that this approach may be useful in reducing DSH among women with BPD (Gratz & Gunderson, in press). Similarly, experiential avoidance behaviors are key targets in DBT (Linehan, 1993), which includes a variety of interventions geared toward enhancing radical acceptance of current experience, with mindfulness, distress tolerance, and radical acceptance skills being the most notable exemplars. It is hoped that the EAM will prompt further research into ways to help individuals who struggle with DSH.

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