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The Relation Between Childhood Maltreatment and Self-Injury: A Review of the Literature on Conceptualization and Intervention

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Abstract

The following article reviews literature pertaining to the association between child maltreatment and self-injury and the ways it varies according to maltreatment type. Research supporting various mediators of the relations between different maltreatment types and self-injury is summarized. Informing mediator models, dominant theories of functionality, particularly affect regulation theories, are summarized and granted empirical support. Following from explanations of its functionality, three developmental pathways (regulatory, representational/interpersonal, and reactive/neurobiological) leading from child maltreatment to self-injury are presented within an organizational model of psychopathology. Understanding the deviations in these pathways that perpetuate self-injury helps to inform intervention approaches that forge pathways perpetuating resilience instead. Three psychosocial treatments (i.e., Dialectical Behavior Therapy [DBT], Trauma-Focused Cognitive–Behavioral Therapy [TF-CBT], and Acceptance and Commitment Therapy [ACT]) were chosen for review, based upon their accumulating evidence bases, as well as upon the relevance of their core components in correcting or compensating for trauma-related developmental deviations.

Keywords

child abuse, self-abuse/mutilation, treatment/intervention

Key Points of the Research Review

- Self-injury is conceptualized not as a behavior that typifies a specific diagnosis but as an associated feature of multiple psychiatric disorders, most often of those including self-destructive tendencies and/or whose etiology involves trauma.
- Strong associations between child maltreatment and self-injury have been established and replicated, with the most robust findings indicated for childhood sexual abuse. Fewer studies have examined the specific predictive power of childhood physical abuse, with most findings supporting the relation. The research on childhood neglect has been mixed.
- Of the proposed functional explanations of self-injury, affect regulation-based explanations have garnered the most empirical support. Self-injury is most frequently performed to modulate overwhelming emotional states and to disrupt a sense of numbness. To a lesser extent, it is related to interpersonal motivations. The repetitive nature and sometimes long-term persistence of self-injury is best accounted for by behavioral principles.
- Childhood trauma disrupts adaptive skill development across multiple levels of functioning. Self-injury is viewed as a compensatory strategy correcting for deviations in the representational, regulatory, and reactive developmental pathways. The regulatory pathway is particularly important, as it describes the mechanisms by which maltreatment disturbs affect processing capacities.
- Despite differences in conceptualization and specific technique, the core components of DBT, TF-CBT, and ACT are similar in their aims to promote exposure to and tolerance for the affect states that self-injurers ineffectively attempt to avoid or control.

Defining and Describing Self-Injury

Self-injury, also termed "deliberate self-harm," "self-mutilation," and "nonsuicidal self-injury," refers to an array of behaviors used for inflicting harm upon oneself, for purposes

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that are neither socially sanctioned nor with suicidal intent (Favazza, 1998). The most widely accepted classification system espouses four categories of self-injury (Simeon & Favazza, 2001): (a) *stereotypic*, which describes repetitive, rhythmic behaviors performed without affective or social motivation, as can occur in pervasive developmental disorders and disabilities; (b) *major*, which refers to infrequent and dramatic acts of mutilation (e.g., castration), often in the context of a psychotic episode; (c) *compulsive*, which includes highly frequent compulsive or ritualistic behaviors characteristic of impulse control disorders (e.g., trichotillomania); and of present interest; (d) *impulsive,* encompassing all behaviors, episodic or repetitive, performed impulsively and with drive toward tension release or mood elevation. The term *impulsive* self-injury belies the fact that the behavior is typically intentional, is often deliberate (though can occur in dissociative states), and is *direct* in the destruction or alteration of bodily tissue (Yates, 2004). The absence of conscious suicidal intent is important for understanding the function of this type of self-injury to be described in detail below. Because the goal of self-injury is typically to cope, it can be argued that self-injury is theoretically used to delay suicide, and certainly not to end life. Although suicidality is prevalent among individuals who self-injure (Walsh, 2005), suicide and self-injury are conceptually quite distinct.

Although impulsive self-injury subsumes a wide range of behaviors, cutting, or intentional carving of the skin, is the most common form and is most frequently done with razors, pins, or other sharp objects on the forearms and upper legs. Other forms include burning, pulling skin or hair, severe scratching, self-bruising (typically by punching or using objects to hit oneself), and excessive tattooing (Anderson & Sansone, 2003). Even among those who prefer cutting, most self-injurers employ multiple methods (e.g., Favazza & Conteiro, 1988).

Just as the range of self-injurious acts can vary, the severity, frequency, and lifetime duration of these behaviors also are heterogeneous. Although cutting typically results in superficial, nonlethal wounds (e.g., Skegg, 2005), those who self-injure are at high risk of hurting themselves and of requiring medical attention (Whitlock, Eckenrode, & Silverman, 2006). Intuitively, the risk of severe injury increases with the frequency of self-injury. Reported lifetime frequency varies from single to hundreds of self-injurious acts (Laye-Gindhu & Sconert-Reichl, 2005; Whitlock et al.).

Prevalence and Course

Actual prevalence rates are difficult to ascertain, due to methodological inconsistencies across studies, particularly in defining self-injury (Yates, 2004). Inclusion criteria in operationalizing self-injury vary across studies, sometimes including pill abuse and eating-disordered behavior (e.g., Laye-Gindhu & Schonert-Reichl, 2005), hair pulling (e.g., Briere & Gil, 1998), and "banging" (e.g., Muehlenkamp & Gutierrez, 2004). Nevertheless, all studies surveyed included cutting, scratching, biting, self-hitting, and burning behaviors in assessment of self-injury. While Briere and Gil surveyed rates of about 4% from a nonclinical sample and 21% from a clinical sample, the more recent studies of high school populations have shown 13%–24% lifetime prevalence rate of self-harm behaviors (Laye-Gindhu & Schonert-Reichl; Muehlenkamp & Gutierrez).

As child care professionals working directly with youth can validate, there is evidence of a steadily increasing rate of cutting among high-school aged children (e.g., Boyce, Oakley-Browne, & Hatcher, 2001). Self-injury is most often initiated in middle adolescence, between the ages of 12 and 15 (Yates, 2004), with rates of self-injury among adolescents as high as 40%–60% (Darche, 1990; DiClemente, Ponton, & Hartley, 1991). Once self-injury begins, it tends to be episodic. Episodes occur as consecutive periods of weeks, months, or years, during which time the frequency of the behavior also varies. Although many adolescents stop self-injuring within 5 years of starting, it can persist into adulthood (Whitlock et al., 2006).

Correlates

Sociodemographics. Rates of self-injury tend to be similar across races, ethnicities, and socioeconomic groups (Marshall & Yazdani, 1999; Whitlock et al., 2006). Although self-injury, and cutting in particular, has historically been associated more with girls, with ratios as high as 3:1 (Laye-Gindhu & Schonert-Richl, 2005; Whitlock et al.; Yates, 2004), emerging evidence of gender differences is less consistent (e.g., Muehlenkamp & Gutierrez, 2004). Most early research draws from clinical samples, where females are overrepresented.

Comorbidity of psychiatric diagnoses. Because it occurs across a variety of clinical and nonclinical populations, and in association with a wide continuum of emotional and behavioral problems, self-injury is conceptualized not as a behavior that typifies a specific diagnosis but as an associated feature of multiple psychiatric disorders. Disorders that feature self-injury tend to self-destructive tendencies and/or have etiology associated with trauma, including borderline personality disorder (BPD), eating and substance abuse disorders, depression, and anxiety (Dyer et al., 2009; Yates, 2004). BPD is the only psychiatric diagnosis that includes self-injury as a diagnostic criterion in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association [APA], 2000), which may arguably inflate statistical relations between self-injury and BPD (Favazza, 1998). Self-injury is more strongly and reliably associated with dissociative and posttraumatic stress disorder (PTSD), diagnoses whose criterion include traumatic or stressful experience/experiences as a diagnostic precursor (APA, 2000; Dyer et al.; Zlotnick, Mattia, & Zimmerman, 1999). Although the exact nature of these associations is complex, there are well-established relations between trauma, dissociative symptoms, and self-injury (Briere & Gil, 1998; Brodsky, Cloitre, & Dulit, 1995; Zlotnick et al.).

Table 1. Summary of Key Findings on the Relation of Maltreatment to and Functions of Self-Injury

Authors	Samples	Key Findings
Laye-Gindhu and Schonert-Reichl (2005)	424 adolescents	Adolescents described negative affective states prior to self-harm and reductions after episode. Most common reasons for harm included feeling a need to hurt self, depression, negative feelings toward self, isolation, and distraction.
Briere and Gil (1998)	Study 1: General (n = 927); Study 2: clinical (n = 390); Study 3: self-identified, as self-injuring (n = 93)	Child sexual abuse was significantly associated with self-harm in all samples. Study 3 findings suggest that nonsexual and sexual trauma combined is associated with SMB.
Brodsky, Cloitre, and Dulit, (1995)	60 women in a psychiatric setting diagnosed with BPD	Child abuse (physical and sexual) and dissociation significantly associated with self-injury.
Gratz, Conrad, and Roemer (2002)	151 undergraduate men and women	Insecure attachment, childhood separation, emotional neglect, sexual abuse, and dissociation were significant predictors of self-harm.
Glassman, Weierich, Hooley, Deliberto, and Nock (2007)	94 adolescent girls	Physical, sexual, and emotional abuse were significantly associated with self-injury, with self-criticism mediating the relation between emotional abuse and self-injury.
van der Kolk, Perry, and Herman (1991)	74 adult men and women diagnosed with BPD	Child sexual abuse, physical abuse, parental neglect and separation, were significantly associated with self-injury, with neglect as the most significant predictor. At follow-up only participants with histories of child sexual abuse and neglect continued to self-harm.
Yates et al. (2008)	Longitudinal study of 164 children up to 26 years old	Child sexual abuse predicted recurrent self-injury, whereas child physical abuse predicted intermittent self-injury.
Deiter, Nicholls, and Pearlman (2000)	233 adults from partial hospitalization and outpatient settings	Self-injury and history of child abuse significantly associated with impairments in affect tolerance, self-worth, and connectedness with others.
Paivo and McCulloch (2004)	100 female undergraduate students	Alexithymia mediated the relation between child maltreatment (emotional and physical abuse/ neglect) and self-injury.
Dubo et al. (1997)	42 inpatient adults with BPD diagnosis and 17 other Axis II diagnosis patients	Self injury was present exclusively in the BPD group, typically chronic. Parental sexual abuse and emotional neglect both predicted self-harm, with the latter identified as the stronger predictor.
Klonsky and Moyer (2008)	Meta-analysis	Child sexual abuse and self-injury only were modestly correlated with common risk factors.
Rodriguez-Srednicki (2001)	441 female college students, with history of sexual abuse (n = 175) and no history of sexual abuse abuse (n = 266)	Dissociation mediated the relation between child sexual abuse and self injury.
Aglan et al. (2008)	Longitudinal study of 158 adolescents	Effects of child sexual abuse on self-harm were mediated by high adversity and major depression; family dysfunction also indirectly contributed self-harm risk.
Carroll, Schaffer, Spensley, and Abramowitz (1980)	28 (adults in a psychiatric facility 14 who self-injured and 14 who did not self-injure)	Major separations from caregivers and child physical abuse were associated with self injurious behavior.
Green (1978)	120 children (60 physical abused, 30 neglected, 30 control)	Physically abused children reported significantly higher rates of self-injury than non-abused children.
Weiderman et al. (1999)		Sexual abuse, physical abuse, and witnessing violence uniquely related to self-injury.
Akyuz, Sar, Kugu, and Dogan (2005)	251 Turkish women	Physical abuse, emotional abuse, sexual abuse, and neglect were significantly associated with self-mutilation and suicide attempts; physical and sexual abuse also predicted higher dissociation.

(continued)

Table 1 (continued)

Authors	Samples	Key Findings
Matsumoto, Yamaguchi, Chiba, Asami, Iseki, and Hirayasu (2004)	201 delinquent adolescents (178 males and 23 females)	Adolescents who engaged in self-harm reported more trauma, with early separation and physical abuse as the most important pathogenic factors. Similarly, higher levels of dissociation were reported.
Nock and Prinstein (2004)	108 adolescent psychiatric inpatients referred for self-injury	Adolescent endorsed multiple reasons for engaging in self-harm behavior, most frequently for automatic positive reinforcement, i.e., both decrease and increase of emotional or physiological experience.
Nock and Prinstein (2005)	89 adolescent psychiatric inpatients	Automatic negative reinforcement, the most frequently endorsed function, was uniquely associated with hopelessness and a history of suicide attempt. Social functions of self-injury were significantly related with younger age, ethnic minority status, and symptoms of MDD.
Nock, Prinstein, and Sterba (2009)	30 adolescents	Self-injury preceded by greater intensity and shorter duration of thoughts, suggesting it to be a coping strategy. Reported functions of behavior supported model of behavioral and social purposes.
Nixon, Cloutier, and Aggarwal (2002)	42 adolescents in an inpatient setting	Primary reasons for engaging in self-injury were to cope with feelings of depression and reduce "unbearable tension."
Weierich and Nock (2008)	86 adolescents	PTSD symptoms of re-experiencing and avoidance/ numbing mediated the relation between child sexual abuse and self-injury.

Note. BPD = borderline personality disorder; MDD = Major Depressive Disorder ; PTSD = Posttraumatic Stress Disorder

The Relation Between Child Maltreatment and Self-Injury: A Review of the Literature

In the context of trauma, exposure to child maltreatment, including sexual and physical abuse and neglect, is the most salient environmental risk factor for self-injury identified to date (Brodsky et al., 1995; Gratz, 2003; Gratz, Conrad, & Roemer, 2002). Numerous retrospective studies from community and clinical samples have reported and replicated strong associations between child maltreatment, particularly child sexual abuse, and self-injurious behavior (e.g., Glassman, Weierich, Hooley, Deliberto, & Nock, 2007; van der Kolk, Perry, & Herman, 1991), even above and beyond the effects of other risk factors for self-injury (Yates, Carlson, & Egeland, 2008). More severe maltreatment and familial association with the abuser/ abusers are predictive of increased self-injury (Brodsky et al.; Yates, 2004) and persistence of the behavior into adulthood (e.g., Deiter, Nichols, & Pearlman, 2000). Recent studies have identified mediators of the relation between child maltreatment and self-injury, including self-criticism and alexithymia (e.g., Glassman et al.; Gratz et al., Paivo & McCulloch, 2004), while others have provided evidence for the direct predictive power of maltreatment (e.g., Gratz, et al.; Yates et al.). As the following review suggests, the etiology of self-injury is heterogeneous, as the strength and nature of the relation varies as a function of type of maltreatment.

Child Sexual Abuse

As noted, an extensive body of research provides evidence for the relation between childhood sexual abuse and self-injury (Dubo, Zanarini, & Williams, 1997; Yates, 2004; Yates et al., 2008; van der Kolk et al., 1991). Among most notable findings from a large systematic examination of three studies, Briere and Gil (1998) indicate that while child sexual abuse, but not physical or psychological abuse, is specifically associated with self-injury, the co-occurrence of nonsexual trauma and sexual trauma is most highly associated. More recently, Gladstone et al.'s (2004) path analyses of childhood trauma, personality factors, and self-harm behaviors, support a direct link between sexual abuse and self-injury, above and beyond the contribution of severe depression and other variables.

On the contrary, Klonsky and Moyer (2008) concluded from a meta-analysis that a direct causal relation between sexual abuse and self-injury remains empirically unsupported. A general limitation of the studies reviewed by the authors is that they are cross-sectional, precluding conclusions about directionality. An accumulating line of research has investigated hypothesized mediators of the relation between child sexual abuse and self-injury, including dissociation (Gratz et al., 2002; Rodriguez-Srednicki, 2001; Yates et al., 2008), alexithymia (e.g., Paivo & McCulloch, 2004) chronic major depression (e.g., Aglan, Kerfoot, & Pickles, 2008), and self-criticism

(Glassman et al., 2007). For example, in a prospective study, Yates et al. (2008) found that the relation between self-injury and sexual abuse was partially mediated by dissociation, providing support for both direct and indirect relations with self-injury. Similarly, Gratz et al. found that both child sexual abuse and dissociation independently predicted self-harm behavior in undergraduate women. As per Paivo and McCulloch's (2004) results, alexithymia did not mediate the relation between sexual abuse and self-injury but did mediate its relation with other forms of maltreatment. Taken together, these studies underscore the complexity of the relationships between child sexual abuse, self-injury, and other psychological sequelae of trauma.

Child Physical Abuse

Fewer studies have examined the relation between child physical abuse and self-injurious behavior, but most findings support the connection (e.g., Gratz, 2006; Hawton, Rodham, Evans & Weatherall, 2002; van der Kolk et al., 1991; Yates et al., 2008). Early studies found that physically abused children were more likely to present with self-destructive behaviors, including self-injury (Carroll, Schaffer, Spensley, & Abramowitz, 1980; Green, 1978). Retrospective investigations found strong correlations for child physical abuse and cutting, in both general and clinical samples (van der Kolk et al.,1991; Weiderman, Sansone, & Sansone, 1999). A recent longitudinal investigation with youth further clarified the relation, indicating that physical abuse was associated specifically with intermittent (vs. recurrent) self-injurious behavior, with onset at around 15−16 years of age, and ending before 18 years (Yates et al.). A number of studies have replicated the association in other cultures (e.g., Akyuz, Sar, Kugu, & Dogan, 2005).

Child Neglect and/or Emotional Abuse

Relative to accumulated evidence for the relations between child sexual and physical abuse and self-injury, research provides only mixed support for the link between child neglect and self-injury (van der Kolk et al., 1991; Weiderman et al., 1999). In an early retrospective and prospective study of participants diagnosed with personality disorders or bipolar II disorder, van der Kolk et al. found associations between self-reported child physical and/or emotional neglect and multiple types of self-harm behaviors, both at intake and follow-up assessment, with neglect emerging as the most powerful predictor of such behavior over time. In a sample of women diagnosed with BPD, Dubo, Zanarini, and Williams (1997) reported similar findings, in that both sexual abuse and more strongly, emotional neglect, were significantly related to suicidal behavior and self-injury. In contrast, Weiderman et al. found that other types of maltreatment (sexual, physical, and emotional abuse), but not physical neglect, were related to self-injurious behavior. Likewise, a more recent longitudinal investigation found that while physical neglect appeared more common in the histories of self-injurers (63%), it did not predict group membership between intermittent or recurrent self-injurers (Yates et al., 2008).

The contradictory nature of these results may be due to differences in how neglect was operationalized across studies. Based on structural equation modeling, Dubowitz et al. (2005) offer a multidimensional conceptualization of neglect that includes elements of physical and emotional support, family conflict (i.e., chaos), and affection, and is correlated with trauma sequelae. It is likely that failure to account for the multifaceted and complex nature of neglect as an empirical construct accounts for the mixed findings. It may be more useful to look at the contributory power of specific aspects of neglect, such as child-directed parental criticism.

Summary

Strong associations between self-injury and child maltreatment have been established across studies, with the most robust findings indicated for its association with history of child sexual abuse. Relative to sexual abuse, fewer studies have examined the specific predictive power of childhood physical abuse, with most findings supporting the relation. The research on child neglect has been mixed.

Despite the debatable direct causality of child maltreatment over self-injury, a significant number of child trauma survivors present with self-injurious behaviors. The most accurate and helpful clinical information about these survivors will be gleaned from continued longitudinal research that aims to explicate the processes and contexts in which self-injury follows maltreatment. Recent studies have identified potential mediators of the relation between maltreatment and self-harm (e.g., self-criticism, alexithymia). An important conclusion can be drawn from what has been equivocal support for such mediational models. Patterns of relations may differ as a function of developmental contexts, types, chronicity, and timing of maltreatment experiences. For instance, Yates, Carlson, and Egeland (2008) found that child physical abuse was related to intermittent cutting, whereas child sexual abuse predicted more severe behavior patterns. There is also preliminary support for an additive effect, such that child sexual abuse *and* another maltreatment type carry a stronger association with self-injury than child sexual abuse alone. Finally, research on mediator models will be best informed by an accurate understanding of the functionality of self-injury to be reviewed in the following sections.

The Functions of Self-Injury

Affect Regulation Functions

As previously noted, because self-injury manifests in many forms and across a variety of populations, it is best understood in terms of its functionality and as such, in terms of the reciprocal relations it shares with other psychological events. Of the proposed functional models, affect regulation-based explanations have been offered by a variety of theoretical and developmental approaches and have garnered the most empirical

support (Conners, 1996; Gallop, 2002; Gratz, 2003; Jacobson & Gould, 2007; Linehan, 1993; Peterson, Freedenthal, Sheldon, & Anderson, 2008; Yates, 2004).

Conceptual understanding of self-injury's affect regulation function is informed by Marsha Linehan's (1993) well-established theoretical framework of BPD. In addition to the original conceptualization offered by Linehan, other trauma experts (e.g., van der Kolk, Roth, Pelcovitz, Sunday & Spinazzola, 2005) have delineated theories in which affect regulation serves as a critical construct in understanding severe trauma psychopathology, including self-injury. Affective, or emotional, dysregulation, believed to underlie BPD, PTSD, depression, anxiety, anger, substance abuse, and eating disorders (Yates, 2004), refers to the inability to effectively manage and control intense emotions, involving high affect sensitivity and reactivity, as well as low frustration tolerance. Steven Hayes's extensive work on experiential avoidance, which refers to attempts made to alter the form or frequency of unwanted emotional experiences, is also useful for understanding the affect regulation function of self-injury (e.g., Hayes, Strosahl, & Wilson, 1999). In this framework, individuals with affect dysregulation difficulties are assumed to use self-injury to alter the experience of distress.

Affect dysregulation in the context of experientially intense affect has been validated as a significant predictor of self-injury (Gratz, 2006; Gratz & Chapman, 2007) across a variety of samples not exclusive to individuals with BPD. In nonclinical samples, too, engagement in self-injury has been shown to be related to affect dysregulation (Yates et al., 2008). Anecdotal research indicates that although individuals report practicing self-injury for a variety of reasons, it is most prominently in the context of disruptions in affect management, in response to emotions perceived as being uncomfortable and overwhelming (Gratz, 2003). For example, using a community-based adolescent sample, Laye-Gindhu and Schonert-Reichl (2005) indicate that negative affect states (e.g., anger, depression) are endorsed prior to self-injury, while reductions in the intensity of these states reported after.

Affect regulation explanations for self-injury recognize the paradoxical functions of the behavior, in that it not only regulates or modulates overwhelming emotional states but also elicits emotional arousal (Brown, Comtois, & Linehan, 2002). The aim of self-injury, then, is not only to soothe but to disrupt a sense of numbness that results from experientially avoiding such emotions (Gratz, 2003). Dissociation, the most extreme manner of emotional avoidance, has a well-established relation with self-injury (Briere & Gil, 1998; Brodsky et al., 1995; Zlotnick et al., 1999). Dissociation describes a state of cognitive detachment from one's emotional and/or physical state. It is a means of experientially escaping the emotionality or physical pain associated with cognitive awareness of a situation, such as when a child begins to fantasize about or imagine being "somewhere else" during acts of physical abuse. Per the results of Nock and colleagues (Nock & Prinstein, 2004, 2005; Nock, Prinstein, & Sterba, 2009), more subdued manifestations of avoidance or numbing are also associated with increased self-injury; PTSD and specific depressive symptoms of detachment, feelings of emptiness, anhedonia, and a restricted range of affect contributed to use of self-injury, purportedly to evoke feelings or sensations. Similarly, included among functions of self-injury reported by an adolescent inpatient sample, Nixon, Cloutier, and Aggarwal (2002) found it to be frequently used not only with intense affect, such as frustration and anger but also with depressive mood.

Interpersonal Functions

Yates et al. (2008) conceptualize self-injury as being associated not only with intrapersonal motivations, which include management of internal states of arousal or distress but also with interpersonal motivations. The latter includes attempts to regulate aspects of the interpersonal environment; for example, to evoke an emotional response, such as pity or anger, in another. Just as self-injury is related to affect regulation deficits, it has also been shown to be related to deficits in interpersonal skills. For example, Gratz (2006)'s results indicate a relation between emotional inexpressivity and self-injury among women.

Instrumental Behavioral Functions

Accounting for both affect regulation and interpersonal functions, Nock and Prinstein (2004) present a functional paradigm of self-injurious behavior, based upon principles of behaviorism, which outlines four primary functions: automatic negative and positive reinforcements and social negative and positive reinforcements. In accordance with affect regulation explanations, self-injury operates in favor of automatic negative reinforcement when performed to achieve a reduction in negative affective states, and operates in favor of automatic positive reinforcement when performed to elicit a desired feeling. In accordance with interpersonal explanations for the function of self-injury, social negative reinforcement refers to self-injurious behavior used to avoid social negative consequences; for example, to escape from punishment. The behavior is maintained by social positive reinforcement when performed to elicit a reaction (e.g., attention) from someone.

In support of this behavioral model, Nock and colleagues found that in their series of investigations (Nock & Prinstein, 2004, 2005; Nock, Prinstein, & Sterba, 2005; Nock et al., 2009), adolescents most frequently endorsed automatic negative and positive reinforcement-related reasons for engaging in self-injury, and less often, social reinforcement motivations. Interestingly, those adolescents who engaged in self-injurious behavior reported shorter duration and greater intensity (than those who did not engage) of thoughts related to self-injury, and in general, appeared to be influenced by immediate internal and external contingencies. Also, guilt, shame, and disgust were reported to increase after self-injury and are suspected to contribute to engagement in continued self-harm to extinguish negative emotions.

From this research, Nock (2009) puts forth an explanatory model for the development and maintenance of self-injury that

integrates distal (e.g., child maltreatment, genetic vulnerabilities, family dysfunction), intrapersonal (e.g., high aversive emotions, poor distress tolerance), and interpersonal (e.g., poor communication and problem-solving skills) variables. Nock suggests that while these factors underlie the development of self-injury, the aforementioned reinforcement strategies serve to maintain the behavior.

Summary

Across studies, multiple factors have been reported or identified in motivating and maintaining self-injury. Of these factors, affect regulation and reinforcement paradigms have gained considerable empirical support (Gratz, 2003; Nock, & Prinstein, 2004; Linehan, 1993). Self-injury is most prominently performed to regulate or decrease distressful emotions and also to increase emotional sensitivity. To a lesser extent, self-injury is related to interpersonal motivations. The continuance of self-injury is likely best accounted for by behavioral principles.

Recent models have attempted to integrate these explanations and account for all motivators suspected to serve as contingencies for maintaining the behavior (Nock). Nock's (2009) model is interesting because it is consistent with other models of the pathogenesis of self-injury (e.g., Linehan, 1993), with which it converges to strongly suggest the interacting roles of environmental and individual risk factors. The functionality of self-injury is best understood through close examination of the developmental means by which these risk factors present the drive to self-injure. Child maltreatment, in particular, may contextually grant youth high affect regulation and interpersonal needs, and simultaneously undermine development of healthy skills for satisfying these needs. For this reason, developmental theories for the relation between child maltreatment and self-injury easily follow from these explanations of its functionality (Conners, 1996).

Modeling the Pathway Between Child Maltreatment and Self-Injury

In accordance with the organizational model of psychopathology, Yates (2009) argues that self-injury develops as a compensatory strategy for relational and regulatory adaptation when developmental pathways that otherwise lead to healthy adaptation are curtailed by the effects of trauma or maltreatment. Viewing development as probabilistic rather than deterministic, and accounting for individual differences in patterns of adaptation, the model posits that adaptation is defined with respect to the quality of integration that occurs within and across multiple developmental systems (Yates, 2004, 2009).

Yates (2009) argues that in healthy development, there are three primary developmental pathways, all patterned by early exchanges in the caregiving milieu that allow for differentiation, integration, and the development of self-organization across cognitive, affective, social, and neurobiological levels of functioning: regulatory, representational, and reactive. The salience of maltreatment as an environmental risk factor is best understood in terms of the processes of deviation it causes from these pathways that eventuate in self-injury. The regulatory pathway, which best encompasses the affect regulation function of self-injury, describes the disturbance created by trauma in cognitive and affective processing, integration of thinking and feeling, and development of the capacity to understand and express emotional states. The representational pathway, which accounts for the interpersonal function of self-injury, describes how self-injury eventuates from disturbances in child–caregiver attachment. This pathway elucidates the development of working models of the self and others, and the ways these models subsequently shape the interpersonal milieu. Finally, the reactive pathway describes neurobiological responding to trauma and includes excitatory and inhibitory processes that underlie self-injury.

Regulatory Pathway

In postulating the etiology of BPD, Linehan (1993) argues that the interaction between biological vulnerability to intense emotionality and growing up in an invalidating environment results in self-injury. Likewise, drawing from psychodynamic theory, Yates (2004) cites Kohut's (1977) model of self-injury, in which ineffective parenting, and by extension, child maltreatment, results in either thwarted development of tension-regulating mechanisms or a tendency toward intense affect. Because affect regulation has been identified as the primary function of self-injury, the regulatory pathway is particularly important for clinical intervention, as it describes the precise mechanisms by these theories recognize maltreatment to disturb development of integrative, symbolic, and reflective affect processing capacities (Yates, 2009).

Healthy emotional development requires emotions to be safely and sensitively reflected and accepted, and for tolerance and coping to be modeled, so that children learn to identify, accept, express, and then manage intense affect in an organized, cohesive manner (Ainsworth, Blehar, Waters, & Wall, 1978). Children of abusive households, however, do not have their own affect states reflected, accepted, or clarified for them, but rather, are often discouraged, punished, ignored or otherwise rendered helpless in making emotional expressions. For example, physically abusive caregivers may respond most aggressively to children's crying when perceived as "whining," or to expressions of anger when perceived as "attitude." In this way, children can become "silenced" and not only fearful of their own emotions but without an outlet for emotional expression.

Abusive caregivers not only cause direct pain but simultaneously also fail to model or teach effective emotional regulation strategies. Abuse in any form frequently results from affect dysregulation and mood lability on the part of caregivers, who model not only poor distress tolerance but also marked inconsistencies in the associations that children should learn to make between cognitions, affect, and behaviors. When maltreated children do not learn to predict which caregiver responses will be associated with particular affect states, development of healthy emotional identification is thwarted. As a result of

these interacting processes, development of appropriately differentiated, complex, and symbolized affect is impaired, and the distinctions between affect, cognition, and behavior, and the capacity for using language to describe these experiences do not develop.

Dissociation. The regulatory pathway explains how traumatized children grow up ignorant of what they feel and unable to feel what they are aware of (van der Kolk, 2005; Yates, 2009). Traumatized children may learn either to operate on the basis of unmoderated affect that is not checked by cognition or to depend on cognitively generated information to the exclusion of affect (Yates). While the former proclivity results in the use of self-injury to disrupt experientially intense and seemingly uncontrollable emotions, the latter results in its use to disrupt a sense of derealization or "psychic numbness."

As such, it has been hypothesized that the link between child maltreatment and self-injury is, in some cases, mediated by dissociation (e.g., Rodriguez-Srednicki, 2001). Often used as a method of experientially "escaping" ongoing trauma, dissociation is both a coping skill and when reinforced over time, can become a symptom of traumatic stress (Gratz, 2003). As previously noted, research supporting the mediating role of dissociation in the relation between maltreatment and self-injury is equivocal. Despite well-established relations between trauma, dissociation, and self-injury (Briere & Gil, 1998; Brodsky et al., 1995; Zlotnick et al., 1999), the strengths of the correlations between dissociative tendencies and maltreatment history, as well as its correlations with self-destructive behaviors, are inconsistent across studies and are potentially methodologically contrived (Merckelbach, Horselenberg, & Schmidt, 2002; Merckelbach & Muris, 2001). Rather than being mediated by dissociation, child maltreatment may have a stron direct relation with self-injury (Wachter, Murphy, Kennerley, & Wachter, 2009).

Symbolism. Nonetheless, as Yates (2009) explains, among maltreated children, affect and cognition are dissociated, often simultaneous to a subversion of the normative progression toward the use of symbols (i.e., language) to share emotional experiences. In turn, children are left to process trauma on a nonverbal level (van der Kolk et al., 1996). Another possibility, then, proposed within the regulatory pathway, is that maltreated children may learn to express affect through the body instead (van der Kolk et al.). Yates suggests that in the context of abuse by a primary caregiver, a maltreated child may learn to symbolically associate bodily harm with a sense of interpersonal connectedness. Symbolic explanations can be drawn upon to explain the particularly robust connection between child sexual abuse and self-injury. Perpetrators of child sexual abuse frequently use feelings of attachment and closeness as the method of emotional manipulation to prevent disclosure and thereby conceal or prolong the abuse. The resultant confusion inherent in the simultaneous experiences of intimacy and pain becomes exaggerated by privacy and likely interacts with the use and exploitation of the body during the abuse experience to predict adolescent use of bodily harm as a way of self-soothing.

Representational Pathway

Caregiving milieu. Acting in isolation or in concert with regulatory vulnerabilities, the representational pathway is similar to the regulatory pathway in that it attributes pathologic development most prominently to the caregiving milieu. Drawing from attachment theory, the representational pathway model begins with a child's internalization of his of her caregiver/caregivers as reliable or unreliable, safe, or threatening, and resultant perceptions of the self as deserving or undeserving, effective, or inept (Yates, 2009). When a caregiver repeatedly represents a source of alarm, the child seeks fulfillment of emotional needs and is met instead with feelings of fear rather than protection or solution. Attachment, founded upon attention and emotional validation, becomes fundamentally disorganized, resulting in internalized representations of the self as defective, of others as malevolent, and of the relationship as dangerous (Ainsworth et al., 1978). Yates presents research to support an association between maltreatment and disorganized attachment (e.g., Carlson, Cichetti, Barnett, & Braunwald, 1989). Where no other attachment or communicative strategies have been effective, self-injury may be learned, echoing patterns of dysfunction in self- and other representations.

Self-criticism. Within the representational pathway and in the context of problematic attachment patterns, the emergence of self-criticism may be a particularly important construct (Glassman et al., 2007). Maltreatment in childhood has been associated with low self-esteem and negative self-representations that are stable even in adulthood (Armsworth, Stronck & Carlson, 1999). While internalization of blame for maltreatment, and specifically, a perception of the self as unworthy of care, may be more pronounced among children abused by their caregivers, self-criticism as a trauma symptom is not exclusive to familial abuse histories. Trauma broadly engenders self-hatred and shame, a perceived lack of control, and marked anger in interpersonal relationships, all of which contribute to self-injury (Gratz, 2003), by way of negative self-perception.

Behavioral Perspectives

As Yates (2004) explains, behavioral perspectives on the etiology and maintenance of self-injury are best incorporated within both the regulatory and representational pathway models. While Nock's extensive work (e.g., Nock, 2009; Nock & Prinstein, 2004) is useful in modeling the behavioral contingencies that maintain self-injury generally, Yates draws from two core learning theories, social (Bandura, 1973) and operant (Skinner, 1953), to explain its development within a traumatology framework. According to these two theories, behavioral acquisition is a result of both observational learning and modeling and of patterns of reinforcement, respectively. Consistent with regulatory vulnerabilities, the former explains how

maltreated children may initially learn ineffective affect management strategies through the modeling of their abusive caregivers or perpetrators and later on in life, by peers or media figures, engaging in and being benefited by self-injury. Consistent with both Nock and Prinstein's (2004) model and accounted for by both representational and regulatory vulnerabilities, the operant perspective maintains that self-injury is maintained by the benefits of both negative and positive reinforcement. Because it functions to alleviate the discomfort of either intense affect or dissociation, the maintaining reinforcer is the subsequent removal of aversive affective stimuli or the reduction of tension (Faye, 1995). Finally, positive reinforcement also can encompass maintenance by secondary attention, sympathy, or other interpersonal responses to disclosure or discovery of self-injury.

Reactive Pathway (Yates, 2009)/Hyperarousal

Incorporating the cumulative contributions of the aforementioned processes, Yates (2009) explains hyperarousal as being not only a conditioned response, but a result of the relation between the perception of danger and emotional responsivity being unmoderated by intervening cognitive and symbolic skills. Hyperarousal is conceptualized, then, as being due to deficits in the skills that typically moderate or protect the conditioned emotional response to trauma cues. In the context of deficits in affect regulation and self-soothing skills, self-injury may be the most effective strategy for modulating hyperresponsiveness to intense distress.

The reactive pathway uses biological models to explain hyperarousal (Yates, 2009). Per Yates, maltreatment may initiate neurobiological alterations and physiological cascades that contribute to self-injury, by way of its influences over the structure, organization, and function of neurobiological stress response systems. In particular, Yates reviews evidence for alterations in two biological reactivity systems: the limbic-hypothalamic-pituitary adrenal (L-HPA) axis, which regulates long-term stress responses, and the norepinephrine-sympathetic-adrenal-medullary (NE-SAM) system, which regulates acute stress responses. These two systems share reciprocal connections and together modulate behavioral, emotional, cognitive, metabolic, immunological, autonomic, and endocrine responses to stress. Among maltreated children, alterations in these connections contribute to indiscriminate flight-or-fight responses, depression, anxiety, and suicidality and also may contribute to self-injury (Novak, 2003; Sachsse, von der Heyde, & Heuther, 2002).

Though less relevant to hyperarousal, Yates (2009) also reviews research on alterations in the neurobiological reactivity of the endogenous opioid system (EOS), which contributes to the formation and maintenance of primary attachment relationships and is implicated in pain sensitivity. Empirical interest in the EOS is based upon anecdotal evidence of an analgesic effect of self-injury (Bohus et al., 2000), which is suspected to be associated with lower pain sensitivity among self-injurers, particularly when under subjective duress. A neurosensory alteration in EOS, whether biologically or environmentally triggered, may mediate reduced pain sensitivity among self-injurers (Grossman & Siever, 2001). Alternatively, and consistent with behavioral models, stimulation of the EOS to produce analgesia and elevate mood may, in a positive reinforcement paradigm, underlie the addictive quality of self-injury.

Research has begun to focus upon gene−environment interactions; specifically, serotonergic genes have been implicated in the developmental sequelae of child maltreatment, particularly, depression and suicidality. Per the results of Simeon, Stanley, Frances, and Mann (1992), among self-injurers, there may be a negative correlation between self-injury and imipramine binding (which slows serotonergic function). However, it is unclear whether presynaptic serotonin release is associated with the initiation of self-injury or with its frequency and/or severity. From a closer review of the literature, Yates (2009) argues that the relation between serotonergic function and self-injury is complex and probably nonlinear, involving other systems.

Summary

Childhood maltreatment negatively influences developmental processes across multiple levels, including the self-system, affect regulation and impulse control, and neurophysiology, all of which individually contribute, but likely interact synergistically to predict self-injury. Yates (2004) argues that child maltreatment can significantly disrupt adaptive skill development, so that self-injurious behavior is viewed as a compensatory strategy for affective and relational regulation within each of the representational, regulatory, and reactive developmental pathways. The aim of investigating the deviations in these pathways that perpetuate self-injury is to inform the development of intervention approaches. Each of these pathways can become targets of comprehensive treatment packages and are likely already being addressed by the most powerful components of empirically validated interventions for self-injury.

Interventions for Trauma and Self-Injury

Treatment options available for children and adolescents who self-injure are variable, and include individual, family, and group therapy modalities across different theoretical orientations. Three psychosocial treatments were chosen for review, based upon the relevance of their core components to the constructs reviewed thus far that are suspected to contribute to the development of self-injury. Thus, in accordance with Yates (2004, 2009), emphasis is placed upon the potential efficacy of these treatment components in correcting or compensating for the developmental deviations caused by trauma in regulatory, representational/interpersonal, and reactive/neurobiological pathways. Intervention approaches have largely been developed to target self-injury or trauma-based symptoms, specifically. Despite the robust link between child maltreatment and self-injury, treatment packages to target both symptom sets, inclusive of all core components, are only in preliminary development (see below).

In keeping with an evidence-based practice approach, Dialectical Behavior Therapy (DBT) and Acceptance and Commitment Therapy (ACT) were chosen for review based upon their established efficacy in treating self-injury, specifically, as well as other trauma sequelae, among adults. While the evaluation and identification of empirically supported treatments for self-injury among adolescents remain research imperatives, these two approaches have begun to demonstrate promise (see below). Trauma-Focused Cognitive–Behavioral Therapy (TF-CBT) is reviewed because it is the only intervention package thus far identified as empirically "well established" for the treatment of trauma and specifically, maltreatment sequelae, among children and adolescents (see Silverman et al., 2008 for a review). While other interventions, such as Cognitive Processing Therapy and Eye Movement Desensitization and Reprocessing (EMDR), have been identified as "possibly efficacious" (see Silverman et al., 2008 for a review), descriptions of these approaches remain outside the scope of this article. As reviewed below, TF-CBT is of particular importance because its core components are opined to lend themselves well to being integrated with DBT and ACT principles and techniques for increasing affect regulational capacities.

Although the following review focuses upon psychosocial treatments, it should be noted that pharmacological interventions, and in particular, antidepressant medications, have also been effective in reducing self-injury (Walsh, 2005); research in this area validates the reactive pathway from child maltreatment to self-injury (Yates, 2009).

Dialectical Behavior therapy (DBT)

DBT is the most widely established and efficacious treatment identified to date for the treatment of BPD and self-injury, specifically, among adults (e.g., Linehan et al., 1991, 1993; Linehan et al., 2006; see Lynch, Chapman, Rosenthal, Kuo & Linehan, 2006 and Lynch, Trost, Salsman, & Linehan, 2007, for reviews). Briefly, DBT has been granted classification as a "well-established" treatment of self-injury by way of seven randomized controlled trials (RCTs) specifically assessing treatment of BPD, four RCTs assessing non-BPD outcomes (e.g., eating disorders, comorbid personality disorders), and eight quasiexperimental studies. Based upon its effectiveness for treating self-injury in adults, it has been modified for use with high-risk adolescents (Rathus & Miller, 2002) and has thus far garnered empirical promise for reducing self-injury across a variety of treatment settings (e.g., Katz, Gunasekara, Cox, & Miller, 2004; Sunseri, 2004).

Originally developed for the treatment of self-injury among adults (Linehan, 1993), DBT has been informative in directing treatment specifically of traumatized youth. Emphasizing individual and environment transactions, DBT is a comprehensive multimodal treatment that draws from Zen, Behaviorism and Dialectics. Working within a "dialectic" framework, in which seemingly opposing "truths" are embraced, DBT emphasizes both change and acceptance, the goal being the balance and integration of both in emotional and behavior expression. In concrete practice, the dialectic translates to a balance of style (i.e., irreverent and reciprocal), and technique (i.e., problem solving and validation). In this context, self-injury is conceptualized as being functional, in that it reduces distress in the short-term, and dysfunctional due to its harmful physical, emotional, and interpersonal long-term consequences (Lynch et al., 2007). DBT seeks to resolve this tension with validation of the intensity of distress and the perceived need to relieve oneself of distress (i.e., *acceptance*) coupled with implementation of healthy distress tolerance and self-soothing skills to reduce stress (i.e., *change*). When symptom etiology is associated with trauma, this balance may be manifested as validation/acceptance of abuse-related memories and emotions that serve as triggers to self-injury.

The functional behavioral analysis is considered critical in DBT. Self-injurious behaviors are addressed through frequent behavioral chain analyses of the contingencies maintaining any and all incidents that occur over the course of treatment. This approach helps to elucidate specific treatment targets, which are often deficits in fulfillment of affect regulatory and/or interpersonal needs. As reviewed by Lynch, Chapman, Rosenthal, Kuo and Linehan, (2006), affording focused attention to all aspects of emotional responses leading to self-injury, both serves as an aversive contingency in itself and promotes in vivo exposure to these emotions, to be used for skills practice in session. In other words, the chain analysis promotes intensive focus on the very thoughts, experiences, and emotions that self-injury was used to avoid. Finally, the chain analysis works by enhancing episodic memory for patterns of events that precipitate self-injury, thus allowing for emergence of alternative adaptive skills.

Given that the primary function of self-injury is for affect regulation, the development of a full and varied repertoire of self-soothing, affect management, and distress tolerance skills is also critical in DBT. Behavioral skills include mindfulness, emotional regulation, interpersonal effectiveness and distress tolerance, and are taught across individual and group therapy sessions. Of these, mindfulness is hypothesized to be linked to specific mechanisms of change that include emotion regulation (Lynch et al., 2006). Specifically, mindfulness is a process of orienting to and "becoming one" with present reality, rather than pursuing "distance" from experiences; it is an act of participation that is actively practiced through nonjudgmental observation and description of internal events. As Lynch and colleagues explain, its rationale is consistent with that of interoceptive exposure, in that awareness of distress in the simultaneous absence of dire consequences promotes the active learning of alternative responses to stimuli that elicit unwanted internal experiences. The effectiveness of mindfulness has been demonstrated in establishing attentional control and thereby decreasing affective intensity, and in regulating emotions generally (see Lynch et al. for a review).

Both distress tolerance and emotion regulation skills aim to enhance coping with the intense negative affective states that precede self-injury (Miller, Rathus, & Linehan, 2007). The

development of distress tolerance skills, which include use of distraction and self-soothing, enhances one's capacity to accept and withstand pain that is typically more explicitly associated with external triggers. Emotional regulation skills, which include pleasant activity scheduling and use of "opposite actions" in response to emotional impulses, are more adaptive means of emotional identification and modification (Linehan, 1993). Finally, because DBT recognizes interpersonal relationships and interactions as a primary source of distress as well as comfort, interpersonal effectiveness skills are directed toward increasing assertiveness and appropriate expression of emotional needs, establishing interpersonal priorities, and maximizing self-respect.

The core components of DBT in addressing the affect regulation and avoidance functions of self-injury are important for their similarity to the core components of TF-CBT, to be reviewed below. Skills acquisition and experiential exposure, accomplished through mindfulness practice in DBT, is accomplished in a conceptually similar, but clinically different, manner in TF-CBT.

Trauma-Focused Cognitive Behavioral Therapy (TF-CBT)

In treating self-injury, specifically, traditional CBT has not been supported by a consistent evidence base, relative to that accumulated for DBT, and in fact, may only be useful when it incorporates DBT techniques (see Miller et al., 2007 for a review). However, CBT has well-established efficacy for the treatment of PTSD (see Silverman et al., 2008 for review). As noted, TF-CBT has the most empirical evidence in support of its use with children to target posttraumatic stress symptoms related to maltreatment history (e.g., Cohen, Deblinger, Mannarino, & Steer, 2004; see Silverman et al., for review). Child-focused TF-CBT has particular efficacy in reducing PTSD avoidance and re-experiencing symptoms among youth with a variety of maltreatment histories (Cohen et al.; Weierich & Nock, 2008). As such, in addressing the developmental deviations caused by trauma, TF-CBT may, in turn, effect the propagation and/or maintenance of self-injury. Although its effectiveness for reducing self-injury among maltreatment youth has not been directly examined, conceptually, its core components have great clinical promise for this purpose.

Like DBT, TF-CBT is a skill-building approach that capitalizes upon the use of exposure to alleviate symptomatology. When used with children, it typically begins with development of cognitive–behavioral coping skills to maximize emotional and behavioral readiness to engage in exposure. Particularly relevant to self-injury, skills focused on affect identification and regulation include the use of imagery (i.e., imagining a "safe place"), distraction, self-soothing activities, and relaxation skills, which include diaphragmatic breathing and progressive muscle relaxation. Cognitive skills aim to identify and restructure faulty attributions made about traumatic experiences, and as such, may be helpful in identifying automatic thoughts or core beliefs that precede self-injury (e.g., "It's my fault because I didn't stop it;" "I can't stand it," "I messed everything up by telling."). During exposure, the traumatized individual learns to "re-experience" the trauma under physically and emotionally safe conditions. Much like the experiential exposure offered through mindfulness practice in DBT, the effectiveness of behavioral exposure is attributed to the undermining and disruption of avoidance patterns. Exposure is hypothesized to work through extinction training, whereby the relationship between the conditioned stimulus (i.e., trauma cue) and the unconditioned stimulus (i.e., actual trauma or escape) is "extinguished" via habituation of the fear response in the absence of aversive consequences (Foa, Steketee, & Rothbaum, 1989).

Recently, TF-CBT approaches in which DBT skill-building intervention strategies have been systematically incorporated have gained popularity and promise for the treatment of chronically traumatized adolescents, specifically. These approaches include the Structured Psychotherapy for Adolescents Responding to Chronic Stress (SPARCS; DeRosa et al., 2006) and the Skills Training in Affective and Interpersonal Regulation/Narrative Story-Telling (STAIR/NST; Cloitre et al., 2002; 2006; 2010) group therapy programs, Integrative Treatment of Complex Trauma for Adolescents (ITCT-A; Briere & Scott, 2006), and PARTNERS with Teens: An Integrative Cognitive–Behavioral Treatment Package for Traumatized Adolescents (Lang & Brown, 2008). Information on empirically supported and promising practices is provided by the National Child Traumatic Stress Network (http://www.nctsn.org/nccts/nav.do?pid=ctr_top_trmnt_prom).

Acceptance and Commitment Therapy (ACT)

Finally, rationale for application of ACT (Hayes, 2004; Hayes et al., 1999) to PTSD symptoms and self-injury is based upon its direct focus on experiential avoidance and emotional numbing, primary contributors to both (Orsillo & Batton, 2005). Although there is debate on whether there is sufficient evidence to consider ACT an empirically supported treatment (e.g., Ost, 2008), preliminary findings, including a recent meta-analysis, confirm its efficacy as compared to wait-list in treating a number of clinical problems (Powers, Vörding, & Emmelkamp, 2009). Batten and Hayes (2005) published a treatment case study of a 19-year-old female client with a history of child sexual abuse, neglect, and comorbid PTSD and substance use problems, providing support for its use for traumatized individuals. Furthermore, in Gratz and Gunderson's (2006) examination of group-based ACT treatment of self-harm among women diagnosed with BPD, participants in the ACT treatment condition evidenced significant improvement in all outcomes including self-injury.

ACT's core assumptions and interventions are conceptually similar to those of DBT and TF-CBT. As summarized by Cullen (2006), the goal of ACT is to increase psychology flexibility using six core processes: acceptance (importantly conceptualized as a healthy alternative to avoidance), cognitive defusion, being in the present, understanding self as context,

clarifying and understanding values, and committing to action. These processes collectively aim to increase awareness and acceptance of feelings, undermine the literality of cognitions, orient clients to the here-and-now, and enhance motivation toward moving in chosen life directions.

In treating self-injury among traumatized or maltreated youth, ACT conceptualizes the maladaptive behavior as a form of experiential avoidance, in that it is used to deny or change an affective state. Here, the goal of ACT is the acceptance and tolerance of painful internal events, such as abuse-related memories, thoughts, and emotions, without resorting to self-injury as a way to avoid, distract, or distort them. Not surprisingly, as in DBT, the implementation and practice of mindfulness in daily living, is considered critical to treatment outcome in ACT. Mindfulness is a principal experiential exercise used to demonstrate the limits of controlling internal states, as well as one's tolerance for states typically avoided. In ACT, "willingness" is an important concept and one that can be considered a "dialectic" in a DBT framework, in that it incorporates elements of acceptance and purposeful behavior. Specifically, psychoeducation and normalization of avoidance as a natural reaction to painful experiences is coupled with promotion of "commitment to action:" identification of life values and goals, elimination of avoidance behaviors that interfere with personal fulfillment, and commitment to behavioral changes that are incompatible with self-injury (Orsillo & Batten, 2005). Similar, to exposure in TF-CBT, mindfulness and willingness are represented among trauma survivors as increased tolerance for memories and associated feelings, and simultaneous effective attention to these experiences. ACT, then, demonstrates particular promise for youth with PTSD symptoms that include self-injury, as its contextualized approach increases willingness necessary to experience distress in order to change the dysfunctional behaviors that are used to control it.

Summary

Despite differences in conceptualization and specific technique, the core components of DBT, TF-CBT, and ACT, are similar in their aims to promote exposure to and tolerance for the affect states that self-injurers ineffectively attempt to avoid or control. The approaches all begin by fostering the development of more effective affect regulation skills, particularly important, given the affect regulation function of self-injury. Limiting self-injurious behaviors without developing and assuring the consistent capacity for tolerating negative affect may put youth at risk of relying on other self-destructive behaviors, such as substance use. Trauma is associated with difficult and painful memories that can be triggered by a multitude of cues in the daily life of youth, and both the explicit narrative-based approach of TF-CBT and the experiential exposure and mindfulness approaches of DBT and ACT consider exposure to distress and prevention of the unhealthy self-injury response, the principal intervention for symptom change.

Given the complex nature of the relation between trauma and self-injury, comprehensive treatment packages that incorporate principle components of these approaches for both trauma-related symptoms and self-injury, specifically, are suspected to have the most promise. Specifically, self-injury among traumatized youth seems best addressed through development of distress tolerance and affect regulation skills development, and subsequent experiential exposure, within a framework that is change-oriented and supportive. Taken together, current reviews of these treatments call for dismantling studies to validate what is clinically suspected to be the most potent interventions and therapeutic processes, and development and evaluation of integrated treatment packages that incorporate the best of all approaches, in a manner consistent with developmental theory.

Implications for Practice, Policy, and Research

- Recent studies have identified mediators of the relation between child maltreatment and self-injury, while others have provided evidence for the direct predictive power of child abuse. Recent models have attempted to account for all contingencies suspected to propagate and maintain self-injurious behavior, all of which converge to suggest the interacting roles of environmental and individual risk factors. The etiology of self-injury is heterogeneous, and the strength and nature of the relation varies as a function of type, developmental context, and chronicity of traumatic experiences. Continued longitudinal research using consistent, standardized operationalizations of constructs is necessary to more precisely explicate the processes and contexts in which self-injury follows trauma.
- Dismantling studies of empirically sound treatments of self-injury and trauma (i.e., DBT, TF-CBT, and ACT) would help validate what is clinically suspected to be their most potent interventions and therapeutic processes, and aid the development of integrated treatment packages for both self-injury and trauma.

Based upon what is known about the core components of those empirically sound treatments of self-injury and trauma, important practice implications can be drawn. Of particular clinical importance is the promotion of exposure to and tolerance for the affect states that self-injurers ineffectively attempt to avoid or control. To this end, it is recommended that clinicians working with maltreated and/or self-injuring youth receive education and training in the most updated and empirically promising techniques for developing affect regulation and distress tolerance skills (e.g., mindfulness) and for guiding trauma-based experiential exposure.

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References

Aglan, A., Kerfoot, M., & Pickles, A. (2008). Pathways from adolescent deliberate self-poisoning to early adult outcomes: A six-year follow-up. *Journal of Child Psychology and Psychiatry*, *49*, 508-515.

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation.* Hillsdale, NJ: Erlbaum.

Akyuz, G., Sar, V., Kugu, N., & Dogan, O. (2005). Reported childhood trauma, attempted suicide and self-mutilative behavior among women in the general population. *European Psychiatry*, *20*, 268-273.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders—IV—Text Revision* (4th ed.). Washington, DC: Author.

Anderson, M., & Sansone, R. A. (2003). Tattooing as a means of acute affect regulation. *Clinical Psychology & Psychotherapy*, *10*, 316-318.

Armsworth, M. T., Stronck, K., & Carlson, C. D. (1999). Body image and self perception in women with histories of incest. In J. Goodwin, & R. Attias (Eds.), *Splintered reflections: Images of the body in trauma* (pp. 137-153). New York, NY: Basic Books.

Bandura, A. (1973). *Aggression: A social learning analysis.* Englewood Cliffs, NJ: Prentice-Hall.

Batten, S. V., & Hayes, S. C. (2005). Acceptance and commitment therapy in the treatment of comorbid substance use and post-traumatic stress disorder: A case study. *Clinical Case Studies*, *4*, 246-262.

Bohus, M., Haaf, B., Stiglmayr, C., Pohl, U., Boehme, R., & Linehan, M., (2000). Evaluation of inpatient dialectical-behavioral therapy for borderline personality disorder: a prospective study. *Behaviour Research and Therapy, 38*, 875-887.

Boyce, P., Oakley-Browne, M. A., & Hatcher, S. (2001). The problem of deliberate self harm. *Current Opinion in Psychiatry*, *14*, 107-111.

Briere, J., & Gil, E. (1998). Self-mutilation in clinical and general population samples: Prevalence, correlates, and functions. *American Journal of Orthopsychiatry*, *68*, 609-620.

Briere, J., & Scott, C. (2006). *Principles of trauma therapy: A guide to symptoms, evaluation, and treatment.* Thousand Oaks, CA: Sage.

Brodsky, B. S., Cloitre, M., & Dulit, R. A. (1995). Relationship of dissociation to self-mutilation and childhood abuse in borderline personality disorder. *American Journal of Psychiatry*, *152*, 1788-1792.

Brown, M. Z., Comtois, K. A., & Linehan, M. M. (2002). Reasons for suicide attempts and nonsuicidal self-injury in women with borderline personality disorder. *Journal of Abnormal Psychology, 111*, 198-202.

Carroll, J., Schaffer, C., Spensely, J., & Abramowitz, S. I. (1980). Family experiences of self-mutilating patients. *Clinical and Research Reports*, *137*, 852-853.

Cloitre, M., Cohen, L. R., & Koenen, K. C. (2006). *Treating survivors of childhood abuse: Psychotherapy for the interrupted life.* New York, NY: Guildford Press.

Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: A phase-based treatment for PTSD related to childhood abuse. *Journal of Consulting and Clinical Psychology*, *70*, 1067-1074.

Cloitre, M., Stovall-Clough, C., Nooner, K., Zorbas, P., Cherry, S., Jackson, C. L., et al. (2010). Treatment for PTSD related to child abuse: A randomized controlled trial. *American Journal of Psychiatry, 167*, 915-924.

Cohen, J. A., Deblinger, E., Mannarino, A. P., & Steer, R. (2004). A multisite randomized controlled trial for multiply traumatized children with sexual abuse-related PTSD. *Journal of the American Academy of Child and Adolescent Psychiatry*, *43*, 393-402.

Conners, R. (1996). Self-injury in trauma survivors: Functions and meanings. *American Journal of Orthopsychiatry*, *66*, 197-206.

Cullen, C. (2006). Acceptance and commitment therapy (ACT): A third wave behaviour therapy. *Behavioural and Cognitive Psychotherapy*, *36*, 667-673.

Darche, M. A. (1990). Psychological factors differentiating self-mutilating and non-self-mutilating adolescent inpatient females. *Psychiatric Hospital*, *21*, 31-35.

Deiter, P. J., Nicholls, S. S., & Pearlman, L. A. (2000). Self-injury and self capacities: Assisting an individual in crisis. *Journal of Clinical Psychology*, *56*, 1173-1191.

DeRosa, R., Habib, M., Pelcovitz, D., Rathus, J., Sonnenklar, J., Ford, J., … Kaplan, S. (2006). *Structured psychotherapy for adolescents responding to chronic stress.* Unpublished manual.

DiClemente, R. J., Ponton, L. E., & Hartley, D. (1991). Prevalence and correlates of cutting behavior: Risk for HIV transmission. *Journal of the American Academy of Child and Adolescent Psychiatry*, *30*, 735-738.

Dubo, E. D., Zanarini, M. C., Lewis, R. E., & Williams, A. A. (1997). Childhood antecedents of self-destructiveness in borderline personality disorder. *Canadian Journal of Psychiatry*, *42*, 63-69.

Dubowitz, H., Newton, R. R., Litrownik, A. J., Lewis, T., Briggs, E. C., Thompson, R., … Feerick, M. M. (2005). Examination of a conceptual model of neglect. *Child Maltreatment*, *10*, 173-189.

Dyer, K. F. W., Dorahy, M. J., Hamilton, G., Corry, M., Shannon, M., & MacSherry, A. … McElhill, B. (2009). Anger, aggression, and self-harm in PTSD and complex PTSD. *Journal of Clinical Psychology*, *65*, 1099-1114.

Favazza, A. R. (1998). The coming of age of self-mutilation. *Journal of Nervous and Mental Disease*, *186*, 259-268.

Favazza, A. R., & Conteiro, K. (1988). The plight of chronic self-mutilators. *Community and Mental Health Journal*, *24*, 22-30.

Faye, P. (1995). Addictive characteristics of the behavior of self-mutilation. *Journal of Psychosocial Nursing*, *33*, 36-39.

Foa, E. B., Steketee, G., & Rothbaum, B. O. (1989). Behavioral/cognitive conceptualizations of post-traumatic stress disorder. *Behavior Therapy*, *20*, 155-176.

Gallop, R. (2002). Failure of the capacity for self-soothing in women who have histories of abuse and self-harm. *Journal of the American Psychiatric Nurses Association*, *8*, 20-26.

Gladstone, G. L., Parker, G. B., Mitchell, P. B., Malhi, G. S., Wilhelm, K., & Austin, M. (2004). Implications of childhood trauma for depressed women: An analysis of pathways from childhood sexual abuse to deliberate self-harm and revictimization. *American Journal of Psychiatry*, *161*, 1417-1425.

Glassman, L. H., Weierich, M. R., Hooley, J. M., Deliberto, T. L., & Nock, M. K. (2007). Child maltreatment, non-suicidal self-injury,

and the mediating role of self-criticism. *Behaviour Research and Therapy*, *45*, 1-8.

Gratz, K. L. (2003). Risk factors for and functions of deliberate self-harm: An empirical and conceptual review. *American Psychological Association*, *D12*, 192-205.

Gratz, K. L. (2006). Risk factors for deliberate self-harm among female college students: The role and interaction of childhood maltreatment, emotional expressivity, and affect intensity/reactivity. *American Journal of Orthopsychiatry*, *76*, 238-250.

Gratz, K. L. (2007). Targeting emotion dysregulation in the treatment of self-injury. *Journal of Clinical Psychology*, *63*, 1091-1103.

Gratz, K. L., & Chapman, A. L. (2007). The role of emotional responding and childhood maltreatment in the development and maintenance of deliberate self-harm among male undergraduates. *Psychology of Men & Masculinity*, *8*, 1-14.

Gratz, K. L., Conrad, S. D., & Roemer, L. (2002). Risk factors for deliberate self-harm among college students. *American Journal of Orthopsychiatry*, *72*, 128-140.

Gratz, K. L., & Gunderson, J. G. (2006). Preliminary data on an acceptance-based emotion regulation group intervention for deliberate self-harm among women with borderline personality disorder. *Behavior Therapy*, *37*, 25-35.

Green, A. H. (1978). Self-destructive behavior in battered children. *American Journal of Psychiatry*, *135*, 579-582.

Grossman, R., & Siever, L. (2001). Impulsive self-injurious behavior: Neurobiology and psychopharmacology. In D. Simeon, & E. Hollander (Eds.), *Self-injurious behaviors: Assessment and treatment* (pp. 117-148). Washington, DC: American Psychiatric Publishing.

Hawton, K., Rodham, K., Evans, E., & Weatherall, R. (2002). Deliberate self harm in adolescents: Self report survey in schools in England. *BMJ*, *325*, 1207-1211.

Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behaviour therapy. *Behaviour Therapy*, *35*, 639-665.

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and Commitment Therapy: An experiential approach to behavior change.* New York, NY: Guilford Press.

Jacobson, C. M., & Gould, M. (2007). The epidemiology and phenomenology of non-suicidal self-injurious behavior among adolescents: A critical review of the literature. *Archives of Suicide Research*, *11*, 129-147.

Katz, L. Y., Gunasekara, S., Cox, B. J., & Miller, A. L. (2004). Feasibility of dialectical behavior therapy for parasuicidal adolescent inpatients. *Journal of the American Academy of Child and Adolescent Psychiatry*, *43*, 276-282.

Klonsky, D. E., & Moyer, A. (2008). Childhood sexual abuse and non-suicidal self-injury: meta-analysis. *The British Journal of Psychiatry*, *192*, 166-170.

Kohut, H. (1977). *The restoration of the self.* New York, NY: International Universities Press.

Lang, C. M., & Brown, E. B. (2008). *PARTNERS with teens: An integrative cognitive behavioral treatment package for traumatized adolescents.* Unpublished manual.

Laye-Gindhu, A., & Schonert-Reichl, K. A. (2005). Nonsuicidal self-harm among community adolescents: Understanding the "whats" and "whys" of self-harm. *Journal of Youth and Adolescence*, *34*, 447-457.

Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder.* New York, NY: Guilford Press.

Linehan, M. M., Armstrong, H. E., Suarez, A., Allmon, D. & Heard, H. L. (1991). Cognitive-behavioural treatment of chronically parasuicidal borderline patients. *Archives of General Psychiatry, 48*, 1060-1064.

Linehan, M. M., Comtois, K. A., Murray, A. M., Brown, M. Z., Gallop, R. J., Heard, H. L., ... Lindenboim, N. (2006). Two year randomized trial and follow-up of dialectical behavior therapy vs. therapy by experts for suicidal behaviors and borderline personality disorder. *Archives of General Psychiatry*, *63*, 757-766.

Linehan, M. M., Heard, H. L., & Armstrong, H. E. (1993). Naturalistic follow-up of a behavioral treatment for chronically parasuicidal borderline patients. *Archives of General Psychiatry*, *50*, 971-974.

Lynch, T. R., Chapman, A. L., Rosenthal, Z. M., Kuo, J. R., & Linehan, M. M. (2006). Mechanisms of change in dialectical behavior therapy: Theoretical and empirical observations. *Journal of Clinical Psychology*, *62*, 459-480.

Lynch, T. R., Trost, W. T., Salsman, N., & Linehan, M. (2007). Dialectical behavior therapy for borderline personality disorder. *Annual Review of Clinical Psychology*, *3*, 181-205.

Marshall, H., & Yazdani, A. (1999). Locating culture in accounting for self-harm amongst Asian young women. *Journal of Community Applied Social Psychology*, *9*, 413-433.

Matsumoto, T., Yamaguchi, A., Chiba, Y., Asami, T., Iseki, E., & Hirayasu, Y. (2004). Patterns of self-cutting: A preliminary study on differences in clinical implications between wrist- and arm-cutting using a Japanese juvenile detention center sample. *Psychiatry and Clinical Neurosciences, 58*, 377-382.

Merckelbach, H., Horselenberg, R., & Schmidt, H. (2002). Modeling the connection between self-reported trauma and dissociation in a student sample. *Personality and Individual Differences*, *4*, 695-705.

Merckelbach, H., & Muris, P. (2001). The causal link between self-reported trauma and dissociation: A critical review. *Behaviour Research and Therapy*, *3*, 245-254.

Miller, A. L., Rathus, J. H., & Linehan, M. (2007). *Dialectical behavior therapy for suicidal adolescents.* New York, NY: Guilford Press.

Muehlenkamp, J. J., & Gutierrez, P. M. (2004). An investigation of differences between self-injurious behavior and suicide attempts in a sample of adolescents. *Suicide & Life-Threatening Behavior*, *34*, 12-24.

National Child Traumatic Stress Network. (2008). *Empirically supported treatments and practices*. Retrieved from http://www.nctsn.org/nccts/nav.do?pid=ctr_top_trmnt_prom

Nixon, M. K., Cloutier, P. F., & Aggarwal, S. (2002). Affect regulation and addictive aspects of repetitive self-injury in hospitalized adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *41*, 1333-1341.

Nock, M. K. (2009). Why do people hurt themselves: New insights into the nature and functions of self-injury. *Current Directions in Psychological Science*, *18*, 78-83.

Nock, M. K., & Prinstein, M. J. (2004). A functional approach to the assessment of self-mutilative behavior. *Journal of Consulting and Clinical Psychology*, *72*, 885-890.

Nock, M. K., & Prinstein, M. J., & Sterba, S. K. (2009). Revealing the form and function of self-injurious thoughts and behaviors: A real-time ecological assessment study among adolescents and young adults. *Journal of Abnormal Psychology, 118*, 816-827.

Nock, M. K., Prinstein, M. J., & Sterba, S. K. (2005). Revealing the form and function of self-injurious thoughts and behaviors: A real-time ecological assessment study among adolescents and young adults. *Journal of Abnormal Psychology*, *118*, 816-827.

Novak, M. A. (2003). Self-injurious behavior in rhesus monkeys: New insights into its etiology, physiology, and treatment. *American Journal of Primatology*, *1*, 3-19.

Orsillo, S. M., & Batten, S. V. (2005). Acceptance and commitment in the treatment of posttraumatic stress disorder. *Behavior Modification*, *29*, 95-129.

Ost, L. (2008). Efficacy of the third wave of behavioral therapies: A systematic review and meta-analysis. *Behaviour Research and Therapy*, *46*, 296-321.

Paivo, S. C., & McCulloch, C. R. (2004). Alexithymia as a mediator between childhood trauma and self-injurious behaviors. *Child Abuse & Neglect*, *28*, 339-354.

Peterson, J., Freedenthal, S., Sheldon, C., & Anderson, R. (2008). Nonsuicidal self injury in adolescents. *Psychiatry*, *5*, 20-26.

Powers, M. B., Vörding, M. B., & Emmelkamp, P. M. G. (2009). Acceptance and commitment therapy: A meta-analytic review. *Psychotherapy and Psychosomatics*, *78*, 73-80.

Rathus, J. H., & Miller, A. L. (2002). Dialectical behavior therapy adapted for suicidal adolescents. *Suicide and Life-Threatening Behavior*, *32*, 146-157.

Rodriguez-Srednicki, O. (2001). Childhood sexual abuse, dissociation and adult self-destructive behavior. *Journal of Child Sexual Abuse*, *10*, 75-90.

Sachsse, U., von der Heyde, S., & Huether, G. (2002). Stress regulation and self-mutilation. *The American Journal of Psychiatry*, *4*, 672.

Silverman, W. K., Ortiz, C. D., Viswesvaran, C., Burns, B, Kolko, DJ, Putnam, F.W., & Amaya-Jackson, L. (2008). Evidence-based psychosocial treatments for children and adolescents exposed to traumatic events. *Journal of Clinical Child & Adolescent Psychology*, *37*, 156-183.

Simeon, D., & Favazza, A. R. (2001). Self-injurious behaviors: Phenomenology and assessment. In D. Simeon, & E. Hollander (Eds.), *Self-injurious behaviors: Assessment and treatment* (pp. 1-28). Washington, DC: American Psychiatric Publishing.

Simeon, D., Stanley, B., Frances, A. J., & Mann, J. J. (1992). Self-mutilation in personality disorders: Psychological and biological correlates. *The American Journal of Psychiatry*, *149*, 221-226.

Skegg, K. (2005). Self-harm. *Lancet*, *366*, 1471-1483.

Skinner, B. F. (1953). *Science and human behavior*. New York, NY: Macmillan.

Sunseri, P. A. (2004). Preliminary outcomes on the use of dialectical behavior therapy to reduce hospitalization among adolescents in residential care. *Residential Treatment for Children & Youth*, *21*, 59-76.

van der Kolk, B. A., Perry, C. J., & Herman, J. L. (1991). Childhood origins of self-destructive behavior. *The American Journal of Psychiatry*, *12*, 1665-1671.

Van der Kolk, B. A. (2005). Developmental trauma disorder: Toward a relational diagnosis for children with complex trauma histories. *Psychiatric Annals, 35*, 401-408.

van der Kolk, B. A., Pelcovitz, D., Roth, S., Mandel, F., McFarlane, A., & Herman, J. L. (1996). Dissociation, somatization, and affect dysregulation: The complexity of adaptation to trauma. *American Journal of Psychiatry, 153*, 83-93.

van der Kolk, B. A., Roth, S. Pelcovitz, D., Sunday, S., & Spinazzola, J. (2005). Disorders of extreme stress: The empirical foundation of a complex adaptation to trauma. *Journal of Traumatic Stress, 18*, 389-399.

Wachter, T., Murphy, S., Kennerley, H., & Wachter, S. (2009). A preliminary study examining relationships between childhood maltreatment, dissociation, and self-injury in psychiatric outpatients. *Journal of Trauma & Dissociation*, *3*, 261-275.

Walsh, B. W. (2005). *Treating self-injury: A practical guide.* New York, NY: Guilford Press.

Weiderman, M. W., Sansone, R. A., & Sansone, L. A. (1999). Bodily self harm and its relationship to childhood abuse among women in a primary care setting. *Violence Against Women*, *5*, 155-163.

Weierich, M. R., & Nock, M. K. (2008). Posttraumatic stress symptoms mediate the relation between childhood sexual abuse and nonsuicidal self-injury. *Journal of Consulting and Clinical Psychology*, *76*, 39-44.

Whitlock, J. L., & Eckenrode, J. E. & Silverman, D. (2006). The epidemiology of self -injurious behavior in a college population. *Pediatrics*, *117*, 42.

Yates, T. M. (2004). The developmental psychopathology of self-injurious behavior: Compensatory regulation in posttraumatic adaptation. *Clinical Psychological Review*, *24*, 35-74.

Yates, T. M. (2009). Developmental pathways from child maltreatment to nonsuicidal self-injury. In M. K. Nock (Ed.), *Understanding nonsuicidal self-injury: Origins, assessment, and treatment* (pp. 117-137). Washington, DC: American Psychological Association.

Yates, T. M., Carlson, E. A., & Egeland, B. (2008). A prospective study of child maltreatment and self-injurious behavior in a community sample. *Development and Psychopathology*, *20*, 651-671.

Zlotnick, C., Mattia, J. I., & Zimmerman, M. (1999). Clinical correlates of self-mutilation in a sample of general psychiatric patients. *Journal of Nervous and Mental Disease*, *187*, 296-301.