

To Sleep Perchance to Dream: Trauma Response and the Function of Nightmares and Rumination in Trauma Survivors

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*This paper is dedicated to my Father,
who dutifully served his country in the
Vietnam War and in 1983 took his own
life because he could no longer face
the horrors of each night spent in dreams.*

Abstract

Though extensive research in the field of trauma has been conducted, no definitive explanation has been found as to the function of nightmares and ruminations in trauma survivors and what comprises the risk factors of maladaptive trauma responses. Focusing on the cognitive processes involved in adaptation to trauma, five of the best-established and most substantiated theories are reviewed. These five theories: Horowitz's (1986) theory of stress responses, Janoff-Bulman's (1983, 1992) theory of assumptive worlds, Jones and Barlow's (1990) theory, Pennebaker's (1987) theory, and Litz and Keane's (1989) theory were chosen because they are comprehensive, influential, and innovative representations of empirical research. After review of these five theories, implications for future research illuminating the phenomena of trauma and trauma response will be discussed.

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*"Oh God, I could be bounded in a nutshell and count myself a king of infinite space,
were it not that I have bad dreams." --[Hamlet II, ii251-252]*

During the past decade, there has been tremendous growth in theory and empirical research concerning the aftereffects of traumatic experiences. This work has enhanced the understanding of the cognitive, behavioral, emotional, physiological, and neuro-hormonal effects of trauma. Despite these advances, the literature still lacks a consistent definition of what differentiates normative from maladaptive responses to severe stress. For example, intrusive thoughts and images, most commonly in the form of disruptive dreams and nightmares, have been described as one of two "general response tendencies to stressful events" (Horowitz, 1986a, p.85), as "an adaptive pathway" in the search for "personal meaning" following trauma (Williams, 1983, p. 4), and as "the cardinal symptom of the [posttraumatic stress] disorder" (Zimering, Caddell, Fairbank, & Keane, 1993, p. 339 as cited in Greenberg, 1995).

The purpose of this paper is to examine the literature in the field of trauma and draw conclusions as to the function of nightmares and ruminations in trauma survivors. What is it that causes one individual to take a step back and use their intrusive thoughts and nightmares as a means of recovery, while another person is suffering horribly as they re-live the event every time an image sneaks into their conscious? Focusing on the cognitive processes involved in adaptation to trauma, five of the best-established and most substantiated theories will be reviewed. A focus will be put on Horowitz's (1986) theory of stress responses and Janoff-Bulman's (1983, 1992) theory of assumptive worlds. Jones and Barlow's (1990) theory, Pennebaker's (1987) theory, and Litz and Keane's (1989) theory will also be reviewed, but not in great detail. These theories were chosen because they focus on the cognitive processes involved in recovery from trauma and because they are comprehensive, influential, and innovative representations of empirical research. After review of these five theories, implications for future research illuminating the phenomenons of trauma and trauma response will be discussed.

Trauma and Diagnosis of Post-traumatic Stress Disorder

If the effects of contemplating past traumas are not uniformly positive, how do we differentiate between adaptive, normative, and persistently maladaptive ways of confronting these events? The most recent edition of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; APA, 1994) defines two distinct types of psychological disorders that can result from trauma exposure: post-traumatic stress disorder (PTSD) and acute stress disorder. The stressor criterion is the same for both disorders and requires that (a) "the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others;" and (b) "the person's response involved intense fear, helplessness, or horror" (APA, 1994, p. 427-28). The diagnostic criteria for both disorders also require that the following types of responses be present: reexperiencing of the traumatic event; avoidance of stimuli associated with the trauma; increased arousal; and clinically significant distress or impairment in social, occupational, or other areas of functioning (APA, 1994).

The major difference between these two disorders involves the duration of responses. PTSD is diagnosed only if the duration of disturbance from symptoms is at least one month. If the disturbances are present for at least two days and not more than four weeks following the trauma, acute stress disorder is diagnosed. Because reexperiencing and arousal in the immediate aftermath of a trauma are not necessarily predictive of longer-term dysfunction (Shalev, 1992), the diagnosis of acute stress disorder also requires that three or more of the following dissociative symptoms occur either during or after the distressing event: numbing or detachment, reduced awareness of surroundings, derealization, depersonalization, and dissociative amnesia (APA, 1994). These criteria suggest that reexperiencing, avoidance, and arousal reactions are not, in themselves, signs of mental disorder. Only reactions that are distressing, disruptive, and persistent or accompanied by dissociation are symptomatic of psychological maladjustment.

The DSM-IV criteria were designed to diagnose psychological dysfunction and, therefore, tell us little about satisfactory or optimal adjustment to trauma. Why do some individuals who experience a traumatic event develop acute stress disorder or

PTSD while others return to normal functioning? Why do some individuals find their intrusive thoughts and nightmares to be 'therapeutic' while others find them to be a horrifying state of re-living their traumatic experience? Perhaps the effects of confronting past traumas depend upon the types of cognitive and physiological changes that are produced by such confrontation. Mentally reviewing past traumas may be beneficial, only to the extent that such review: (a) Reduces physiological strain associated with deliberate efforts to inhibit such material and produces cognitive insight and schema change (Horowitz, 1986; Pennebaker & Beall, 1986), (b) produces more constructive appraisals of the traumatic memory and more effective "coping strategies to address" problems posed by the trauma (Janoff-Bulman, 1989; Lazarus & Folkman, 1984), or (c) results in less physiological reactivity to and less threatening appraisals of reminiscent stimuli associated with the trauma (Foa et al., 1989; Jones & Barlow, 1980).

Memory and Rumination

With all of the past research on trauma, we have become much more familiar with its causal effects; however, we have not clearly differentiated normative from maladaptive patterns of response. One possible reason for these divergent views is that theorists are focusing on qualitatively different types of cognitive responses when examining ruminative tendencies. Trauma survivors who experience a sudden feeling that a life-threatening situation is recurring will have quite different implications for adjustment than a trauma survivor who experiences a mental review of the traumatic event, which provides a fresh perspective from which to evaluate past actions and decisions. A common theme underlying diverse theories of adjustment to trauma (e.g., Foa, Steketee, & Rothbau, 1989; Horowitz, 1986; Janoff-Bulman & Frieze, 1983; Pennebaker, 1990) is that healthy adjustment is the result of repeated confrontations with the memories of the trauma and their subjective meanings. However, mere exposure to traumatic memories does not always facilitate recovery. Some research studies support the conclusion that "...when after an extended period of the search [for meaning] fails to bring understanding, the continuing process of searching and repeatedly ruminating appears to be maladaptive" (Silver, Boon, & Stones, 1983 as cited in Greenberg, 1995). Thus, depending on the individual, ruminations can be quite therapeutic or can quickly become the source of further traumatization.

Understanding how people remember trauma requires a familiarity with the science of human memory. Most laboratory research concerns how people remember lists of words, numbers and other innocuous material. Seldom have psychologists studied memory from the perspective of the ruminative thoughts that haunt survivors of trauma (McNally, 2003). Almost everything known about these reexperiencing symptoms is based on retrospective reports of trauma survivors. It is of course a matter of ethics to work with trauma survivors. How much can researchers pry into the minds of trauma survivors without being at least the partial cause of their further traumatization? Researchers are forced to take what information they can, and retrospective reports have most certainly been a wonderful tool to give useful insight into the phenomenon of trauma.

Ruminations have been described as conscious thinking directed toward a given object for an extended period of time (Martin & Tesser, 1989). According to Gold & Wegner (1995), ruminations, which include the subclass of intrusive thoughts and

images, have historically been grouped under the rubric "cognitive factors in anxiety" (Tallis, Davey, & Capuzzo, 1994), along with obsessional thoughts (Rachman & Hodgson, 1980), negative automatic thoughts (Beck, 1976), and worry (Borkevec, Robinson, Pruzinsky, & Depree, 1983). While ruminations share similarities with these other types of cognitive activities, such as their automatic and intrusive nature, they differ in at least one important way--ruminations are usually thoughts about events that have occurred in the past. Ruminations contain a rigid, irreversible, irrevocable and sometimes pointless quality because they are typically about events that cannot be altered or changed (Gold & Wegner, 1995).

Ruminations may originate for a variety of reasons, and it seems they may continue because of our attempts to control them. We think of something again and again because it is distressing, because it disturbs our plans, because we don't want to tell others about it, and perhaps ultimately, because we try not to. There are many ways in which something can become a *Zahir*. In Arabic, "Zahir" means visible, manifest, evident; it is one of the ninety-nine names of God; in Muslim countries, the masses use the word for "beings, thoughts or things which possess the terrible power of being unforgettable, and whose images finally drives one mad (Borges, 1998).

Ruminations are not thoughts that an individual chooses to remember, but memories that must be remembered. This urgency and driven quality makes ruminations much less pleasant than daydreams. Whereas you may strain to remember some things, there seems to be a "hotline" to traumatic memories (Allen, 1995). It is the automatic and intrusive nature of ruminations that separates them from ordinary thoughts. Unlike information that simply resides in memory to be recalled when it is needed and then stored away again not to return until another need occurs, ruminations intrude--anytime and anywhere (Gold & Wegner, 1995).

According to Freud, reexperiencing trauma, including repeating it in present-day life, are ways of dissipating the intense psychological energy generated by the trauma and of trying to gain mastery over it. It is as if you were watching a movie that ended sadly. You replay the movie again and again, hoping that perhaps this time the ending will be a happy one. It isn't, of course, but you keep watching the movie anyway hoping the ending will somehow change. The unresolved trauma can absorb so much psychological energy in some trauma survivors that they have less energy to devote to work, friends, and family, and most importantly to themselves, in the present (Matsakis, 1996). Nightmares are a means of doing this at a somewhat unconscious level. Individuals are allowed to watch again and again, their traumatic event. Depending on the state of the individual, nightmares can do two things for the trauma survivor. These nightmares can allow the individual to review the incident(s) and find some personal meaning from them or they can cause great distress and further traumatization to the individual if they find the nightmares to be a way of re-living the trauma rather than reviewing it.

Traumatic Nightmares

The question of the function of dreams is one of the oldest asked but still unanswered questions about the everyday activities of the mind. It is a question raised in some form in every ancient text, dramatic, mythic, sacred, or secular, from the East and from the West. And whereas we have some grasp of the functions of sensation, perception, attention, memory and learning, the function of dreams is very

poorly understood. In the *Parva Naturalia*, written almost twenty-five hundred years ago, Aristotle wrote that "we must inquire what dreams are, and from what cause sleepers sometimes dream, and sometimes do not; or whether the truth is that sleepers always dream but do not always remember; and if this occurs, what its explanation is" (Flanagan, 2000).

A popular view of dreams, and especially nightmares advanced by several psychological schools (Freud, 1900; Jung, 1964), is that dreams serve to process disturbing information that cannot be brought into consciousness. Translated into behavioral terms, nightmares are believed to have an anxiety-reducing function. Indeed, individuals who report frequent nightmares are more anxious than those who do not.

Haynes and Mooney (1975) propose that prolonged or intense nightmares involving fear stimuli will result in reduction of physiological responses associated with these stimuli or a reduction in anxiety. Premature termination of the dream by awakening disrupts the exposure process and explains the persistence of some dreams: anxiety has not yet been extinguished. This hypothesis predicts that nightmares will occur more often in highly aroused individuals. If PTSD sufferers were more highly aroused than other anxiety disordered individuals, they would be more likely to experience nightmares. However, clinical observations suggest that many agoraphobics for whom the first panic attack was perceived as life threatening, and, therefore, extremely traumatic and who show high tonic arousal, rarely complain of recurrent nightmares about panic-provoking situations. Perhaps the re-experiencing of the trauma requires an external threat; the sources of the agoraphobic's threat cues are internal (bodily sensations), whereas those of PTSD sufferers are always external (fire, accident, rape, combat). It is interesting to note that some simple phobics will report nightmares at the commencement of treatment by exposure (Mathews, 1986). Indeed, treatment increases arousal levels. The state of high arousal in combination with an external source of threat appears to temporarily render simple phobia similar to PTSD individuals: both report reexperiencing of the feared situations.

Most dreams occur during a stage of sleep characterized by intermittent rapid eye movement (REM), large muscle paralysis, and brain wave activity similar to that of wakefulness. REM dreams are often vivid, emotional, and bizarre, whereas non-REM dreams are vague, fragmented, and more conceptual than visual (Ross et al., 1989; Foulkes, 1962). Nightmares arise almost exclusively during rapid eye movement (REM) sleep. Because REM episodes occur periodically throughout nocturnal sleep (approximately every 90-110 minutes), nightmares may also occur at any time during the sleep episode. However, because REM sleep periods typically become longer and dreaming more intense in the second half of the night, nightmares are also more likely to occur later in the night. Although most people have their nightmares during REM sleep, trauma survivors have them during non-REM sleep as well. Because the muscles are not paralyzed during non-REM sleep, non-REM nightmares can be accompanied by violent thrashing and attacks against bed partners (McNally, 2003).

Stress-caused nightmares tend to connect recent events with memory paths from the past, thus integrating old and new information (Whealin & Francis, 2000). Brainstem activity during sleep generates a jumbled profusion of memories, thoughts, images, desires and emotions which the cerebral cortex then attempts to

shape into a somewhat coherent story. Such dream-narratives range from the relatively normal, mundane worries occurring during non-REM sleep to the "fantastic confabulations" experienced during deep REM sleep (Flanagan, 2000). It is the dreams that occur during the REM sleep cycle that resemble psychotic episodes and give the dreamer 'nightmares.' This process of thinking through all the information in your mind in story form can help an individual to think through situations and see solutions or consequences that he or she may not have seen otherwise.

Nightmares usually terminate with an awakening that is associated with a rapid return of full alertness and lingering sense of fear or anxiety. These factors often lead to difficulty returning to sleep. People tend to awaken during nightmares and replay images of the nightmares throughout the day (Dreams Insights: Nightmares). Nightmares can leave the dreamers with any number of emotions including feelings of anger, guilt, fear, sadness and/or depression. There is evidence to suggest that we dream about recent memory; so if we are distressed about something, we may well dream about it. This is however a natural thing to do and is not necessarily caused by the distress itself (Christos, 2003). PTSD and acute stress disorder appear to represent a failure to recover from a nearly universal set of emotions and reactions and is typically manifested as distressing memories or nightmares related to the traumatic event, attempts to avoid reminders of the trauma, and a heightened state of physiological arousal (Yehuda, 2002).

Hartmann discovered something striking about dreams. They obviously make connections between the trauma and other parts of the dreamer's life, and the connections often involved not the detailed physical events of the trauma, but rather the emotions experienced during the event (Hartmann, 2003). Hartmann (1998) has a theory similar to those of Flanagan (2000) and Whealin & Francis (2000), stating dreams function as a method for alleviating stress by 'cross-connecting.' Hartmann believes dreams first reduce the disturbances caused by stress and 'calms the storm,' not randomly but by an emotion-guided increase in connections. This increase of connections can be adaptive for the future. The connections do not really consolidate the memory but rather broaden the memory through cross connections, which may be useful in increasing adaptation for future functioning. With these new connections, a new trauma or stress will be less "singular", less catastrophic, more familiar and more manageable since broader connections are available--the trauma will now be much more integrated into the individual's experience. It can be seen as helping with memory storage in terms of cross-indexing--making more connections between new material and older material--and sometimes the new broader connections can in themselves be extremely useful. Making new connections means seeing things in a new way. Thus, Hartmann (1998) says dreaming 'calms the storm' by 'cross-connecting'.

Trauma Response Theories

Throughout the history of psychology, there have been large periods of time in which trauma was largely ignored and no research was conducted. There have been times of increased attention, particularly in times of war, during which theories, clinical attention, and research increased dramatically, only to be neglected once the war ceased (Resick, 2001). On the face of it, the question "What causes PTSD?" seems hardly worth asking. The answer is obvious: trauma. However, this simplistic answer over looks two key facts. First, most individuals do not develop PTSD after a

traumatic experience. Second, some individuals develop PTSD after a stressful experience that falls short of 'trauma' (Allen, 1995).

Cognitive processing models of trauma response are based on the assumption that information about past experiences, current worldviews, and expectations about future events are contained in mental schemas (Hollon & Kriss, 1984). These theories describe the ways in which traumatic events can disrupt enduring functional schemas or produce maladaptive schemas (e.g., Before a traumatic experience, an individual may have an unquestionable belief in God; after experiencing the trauma the individual may question the existence of God, justice, and/or 'goodness' as opposed to evil. Some may feel they were being punished for something they did or blame themselves and their actions for whatever happened to them). Some theories also enumerate a variety of schematic reconstruction processes.

In the past two decades, numerous stress response models with cognitive processing components have appeared in literature (e.g., Chemtob et al., 1988; Epstein, 1991; Foa et al., 1989; Horowitz, 1986; Janoff-Bulman & Frieze, 1983; Jones & Barlow, 1990; Litz & Keane, 1989; McCann & Pearlman, 1990; Pennebaker, 1990; Roth & Newman, 1991; Taylor, 1983). Whereas some models enumerate the determinants of successful adjustment to trauma, others seek to explain the development of PTSD. To fully understand trauma and to better know which stress response models are most applicable, it is necessary to look at how the traumatic event is remembered and what effects this remembrance has on the individual.

Although most people do not live without a certain level of stress and daily hassle, serious trauma is, by its very nature, unexpected and rare. That is to say, traumatic events are not common daily experiences in most people's lives. Some people never experience the most serious levels of trauma in their lifetime. However, the majority of people do experience at least one traumatic stressor and a large number experience more than one of these major events (Resick, 2001). Most studies indicate that approximately 70 percent of the population experience at least one traumatic stressor during their lifetime (Resick, 2001).

What makes a stressor 'traumatic?' How are traumatic stressors different from ordinary ones? Any attempt to understand how people remember 'trauma' presupposes at least provisional answers to these questions and a working definition of what counts as a traumatic experience. As the psychologist Bonnie Green (1990) has pointed out, three variables may figure in how one defines trauma: an objectively defined event, the person's subjective interpretation of its meaning, and the person's emotional reaction to it.

Recently, trauma literature has been criticized for placing too heavy an emphasis on psychopathology (Joseph, Williams, & Yule, 1993; Lyons, 1991). Several authors have called for increased theoretical attention to the mechanisms that result in successful adaptation. Ursano (1987) has contended, "The study of responses to trauma must include the study of resilience and health." Similarly, Jones and Barlow (1990) have stated "...Perhaps the most important function of any etiological model [of PTSD] is to explain the absence of symptoms in some individuals exposed to similar traumatic conditions." Furthermore, Lyons (1991) has suggested "increased knowledge about those survivors who are able to transcend such adversity is likely to...suggest additional interventions for survivors who fare less well."

Empirical evidence suggests that some individuals exhibit resilience, even in the face of severe trauma. Methodologically sophisticated studies have shown that the bulk of individuals exposed to severe stressors, including combat in Vietnam (Kulka et al., 1988), nuclear accidents (Baum, 1987), and disasters (Hartsough & Myers, 1985), do not develop chronic PTSD. Furthermore, some individuals remain optimistic and hopeful despite exposure to severe traumas. A comparative study of Holocaust survivors and matched controls who had immigrated to Israel during the same period as survivors (Carmil & Breznitz, 1991) found that, almost 50 years after the Holocaust, both survivors and their children endorsed stronger beliefs in God and a better future, relative to controls and their children. Another recent study of adult survivors at sea (Joseph et al., 1993) found evidence that "...there [were] strong positive changes in values and views about life and other people [resulting from the disaster]."

Horowitz's Trauma Response Theory

Horowitz (1986) has proposed two general types of response to stress. The first response mode involves intrusive repetitions of the trauma in thought, imagery, emotion, or behavior. Because states of intrusion are inherently painful, a second response mode develops, which involves attempts to suppress these intrusions, using mechanisms such as ideational denial, emotional numbing and deliberate avoidance of reminders.

The process of adjustment to trauma is described as comprising five phases (a) outcry or initial realization that the stressor has occurred, (b) denial and numbness, (c) intrusive repetition, (d) working through, and (e) completion. This sequence of phases is not presumed to be universal; individuals may skip certain phases or demonstrate alternative sequences of phasic responding. The working through phase involves a prolonged alternation of denial and intrusion, with gradual decreases in the intensity of responding. Completion occurs when there is a "resolution of differences between new information and enduring mental models." However, "later events may re-ignite the original traumas' emotional meaning, causing the cycle of phases to be repeated."

Horowitz explains the recurrence of traumatic memories in terms of two aspects of psychoanalytic theory; a purposeful need to master the trauma and a more instinctive, automatic compulsion to repeat the trauma. He proposes that the contents of active (short-term) memory will be repeatedly represented in consciousness until cognitive processing of the event is complete, at which time the event is stored in long-term memory. Involuntary repetitions are not necessarily static duplications of the original trauma; they can take a variety of forms, ranging from "...representation by action and sensory images to representation by work meanings" (p.98).

Horowitz (1975) proposes that, in contrast to less stressful events, which are easily assimilated into long-term memory;

Stress events, by definition, will impose some strain on cognitive processing. That is, the working out of how this new information is to be matched and integrated with old information about the self and the world will be hard or time-consuming. For a time, there will not be a good enough match...eventually; ...schemata of self, objects,

attitudes and expectations will have been revised so that the new memories fit adequately (p. 1462.)

Recurrent representations of the trauma may be experienced as intrusive if they are intense and clear, appear despite repeated attempts to suppress them, have no apparent connection to the previous train of thought, or involve resurrection of painful emotions experienced during the trauma (1986).

Sometimes, my head starts to replay some of my experiences in 'Nam.' Regardless of what I'd like to think about, it comes creeping in. It's so hard to push back out again. It's old friends, their faces, the ambush, the screams, their faces [tears]. (Goodwin, 1980, as cited in Williams, 1983).

Horowitz (1988) argues that these intrusive recollections are a necessary part of the psychological adaptation process. They can facilitate (a) modifications of automatic associations and substitution of new ways of thinking, (b) revision of relevant schemas to take into account of information contained in the trauma, (c) resolution of conflicting interpretations of the trauma, and (d) generation of new solutions that address problems posed by changed circumstances (Horowitz, 1986).

In the normal pattern of stress response, the individual "doses" themselves with tolerable levels of intrusion so that they can start working through the personal meanings of the event. Horowitz describes three sets of strategies by which the survivor can control the occurrence, content or affective tone of intrusive ruminations: (a) controlling the mental set (e.g., controlling the frequency, timing and duration of thoughts about the trauma, or framing contemplation of the trauma within a particular time period); (b) controlling schemata as organizers of information (e.g., choosing what schemas of self, relationships, values or world views will structure examination of the trauma); and (c) controlling ideas and sequences (e.g., choosing what information will be utilized or disregarded in reviewing the trauma, viewing the trauma from multiple perspectives, or revising schemata.) For example, an individual with strong adaptive internal controls may choose to (a) focus on brief time intervals when in a problem-solving mode (thinking only about what to do next) or focus on extending time intervals to obtain a less devastating picture of the trauma (as one tragic event in a full and meaningful life), (b) maintain a view of the self as competent and of others as willing and able to provide realistic support, and (c) focus on the current implications of the trauma and avoid regretting past decisions and actions.

Adaptive patterns of cognitive processing are not, however, regarded as universal. Sometimes, the normal sequence of processing is disrupted and processing is not completed. According to Horowitz and Kaltreider (1980),

Pathology is not usually the result of some qualitatively different response, but rather of responses that are of such magnitude that the person requires help, or they are responses that do not progress towards adaptive completion over an extended time (p. 165).

Zilberg, Weiss, and Horowitz (1982) have identified three different forms of pathological stress response syndromes, namely, "frozen and avoidant states," "stuck in undercontrolled intrusion," and "oscillating...between states of high intrusion and high avoidance." For survivors, frozen in avoidant states, controls are excessive and block effective responding, thereby obstructing the working through process. For

survivors "stuck in undercontrolled intrusion" (p. 103), control processes are unable to modulate and organize the flow of distressing information about the trauma, resulting in survivors succumbing to stress.

Horowitz's theory of stress responses provides a conceptually rich and comprehensive account of cognitive processes involved in adaptation to trauma and the ways in which these processes can be facilitated or hindered. The theory can account for the presence of intrusive thoughts and images such as nightmares and the phenomena following stressful events and changes in the intensity of these symptoms over time. Recovery from trauma is explained as resulting from cognitive assimilation of the traumatic memory or a revision of existing schemas to accommodate the new information. The occurrence of delayed forms of PTSD (McFarlane, 1988) can be explained in terms of a movement from the numbing to the intrusive phase of stress response, a decay in the effectiveness of control processes over time, or a change in life circumstances that re-ignited the emotional meaning of the trauma. Horowitz does not elaborate on what particular features of a given situation are likely to reignite traumatic memories.

Janoff-Bulman's Trauma Response Theory

Janoff-Bulman's theory (1983, 1992) of adaptation to trauma is also based on the notion of cognitive schemas. The theory assumes that people's day-to-day functioning is guided by deeply held assumptions about the self and the world. Schematic processing is inherently conservative; individuals will first try to fit anomalous experiences into extant schemas; revision of core beliefs occurs only as a last resort.

The symptoms experienced by victims are indicative of the psychological distress they suffer. Serious illness, violent crime, accidents and disasters are extreme and physically threatening events. They are also unusual events in the life of an individual. For these reasons, victimization taxes the resources of the victim (Lazarus & Cohen, 1978); there are no automatic "adaptive" responses. Being a victim also forces individuals to realize that their "cognitive baggage"--the assumptions and expectations they have held about themselves and their world--has been severely challenged and may no longer be viable. Victims must deal not only with any physical injury resulting from the experience, but also with the tremendous psychological toll exacted by these extreme events. Much of the psychological toll derives from the shattering of very basic assumptions that victims have held about themselves and their world. Their perceptions are now marked by threat, danger, insecurity, and self-questioning. The number of assumptions that are shattered, or at least seriously questioned, by the experience of victimization, is no doubt dependent upon the individual involved. However, there appear to be three types of assumptions shared by most people that are especially affected.

The theory developed by Janoff-Bulman posits that individuals hold three core assumptions: (a) benevolence of the world, (b) meaning in the world, and (c) worthiness of the self. The "benevolent world" schema contains the assumptions that other people are basically trustworthy, moral, and compassionate and that misfortunes occur infrequently. The "meaningful world" schema involves people's beliefs about the distribution of outcomes (Janoff-Bulman, 1989). A meaningful world is one in which events unfold systematically, according to comprehensible rules

(Antonovsky, 1979). Three alternative principles of outcome allocation are suggested: justice, controllability and chance. The "just world theory" (Lerner, 1980) contends that people will get what they deserve. The principle of controllability assumes that outcomes are determined by people's own behaviors. The principle of chance assumes that the distribution of outcomes is random and unrelated to human actions.

The "worthy self" assumptive category contains three self-evaluative dimensions: self-worth, self-controllability, and luck. If outcomes are presumed to be justly distributed, self-worth, or believing oneself to be a decent, ethical person, should decrease perceived vulnerability to adverse outcomes. Alternatively, if outcomes are the result of one's own actions, viewing oneself as capable of exercising forethought and sound judgment should result in diminished perceptions of vulnerability. If outcomes are presumed to be random, perceptions of the self as "lucky" should enable individuals to feel relatively invulnerable to adverse outcomes.

The theory proposes that extraordinary events, which involve threats to survival, contradict the assumptions of self-worth, benevolence, and meaning. Because traumatic events are extremely salient and disturbing, survivors are forcefully confronted with a catastrophic upheaval of their conceptual systems. "Victims experience the loss of old, deep, positive views of the world and themselves." This conceptualization is consistent with anecdotal reports, such as the following:

For the common soldier...war has the feel--the spiritual texture--of a great ghostly fog, thick and permanent. There is no clarity. Everything swirls. The old rules are no longer binding, the old truths no longer true. Right spills over into wrong...you can't tell where you are, or why you're there, and the only certainty is overwhelming ambiguity (O'Brien, 1990).

Characteristics of the trauma are presumed to affect which assumptions are threatened. Disasters caused by forces of nature force survivors to confront the existence of danger and human fragility. Interpersonal victimizations force confrontation with personal vulnerability and the malevolence of other people.

If the old assumptions are rapidly discarded, this could "threaten the breakdown of the entire conceptual system; for the primary postulated represent the foundation on which other beliefs are built" (p.121). Thus, the coping task facing survivors is to reinterpret the trauma in ways that are less incompatible with the old assumptions or to revise their worldviews to accommodate the trauma. Healthy adaptation involves developing a new perspective that can account for the trauma, while preserving self-worth, connection with others, and the ability to modulate terror. Unhealthy adaptation involves a failure to reconstruct adaptive illusions.

Two sets of cognitive strategies are presumed to facilitate the rebuilding of assumptive worlds: automatic routines for processing novel information and deliberate efforts to reinterpret the new information in the light of what is already known. The social and interpersonal context of recovery is also hypothesized to influence the reconstruction process.

Janoff-Bulman (1992) adopts Horowitz's (1986) definition of intrusion and denial as the primary automatic cognitive processing strategies. Intrusions "provide a means for rendering closer and closer approximations of the new, threatening date and the

old assumptions" (Janoff-Bulman, 1992, p.106). However, in some cases, "intrusions [that] evoke extreme levels of fear and anxiety...may preclude any natural process of habituation" (Janoff-Bulman, 1992, p.105). Denial and numbing are regarded as adaptive control processes that "enable survivors to pace their recovery" (Janoff-Bulman, 1992, p.100). In the normal pattern of adaptation to trauma, intrusion and denial subside over time. However, in some cases, excessive intrusion or denial may interfere with social and emotional functioning. Successful recovery is defined as the cessation of intrusive reexperiencing. Instead, "relatively nonthreatening recollections, images and thoughts should occur naturally, in response to situations that are associated with the event" (Janoff-Bulman, 1992, p.110).

Janoff-Bulman's theory focuses "not [on] the appraisals that occur during the initial confrontation with the traumatic situation, but rather [on] interpretations and redefinitions of the event that occur over the course of coping and adjustment." These redefinitions are considered to be a natural outcome of the survivor's reflections upon the trauma, rather than the result of deliberate attempts to restore cognitive control. Three sets of reappraisal strategies are hypothesized: (a) social comparisons, (b) examining the survivor's own role in allowing the victimization to happen, and (c) trying to find meaning in the trauma by reevaluating it as imparting benefits or wisdom.

Examination of the survivor's own roles in facilitating the trauma involves confronting the questions "why did this happen to me?"

It is the selective incidence of the victimization that appears to warrant explanation...particularly if they regard themselves as decent people who take good care of themselves and are appropriately cautious, [victims] are apt to find themselves at a loss to explain why they are victimized" (Janoff-Bulman & Frieze, 1983).

One possible outcome of such an attributional search is self-blame. Attributing the trauma to enduring negative personality characteristics (characterological self-blame) is regarded as maladaptive. However, attributing the trauma to controllable aspects of one's own behavior (behavioral self-blame) is regarded as potentially adaptive because it can restore belief in personal control over outcomes. "Survival guilt" (Grinker & Spiegel, 1945) is conceptualized as a form of self-blame that follows the death of a close other as the survivor seeks to explain; "why have I lived while others have not?" (Janoff-Bulman, 1992) and "How did I ...fail to do right by the lost one?" (Lindemann, 1977).

The process of accepting and ultimately transforming the traumatic experience involves posing the question; "for what end?" To maintain their beliefs in self-worth and a meaningful world, survivors are motivated to view their suffering, although not chosen, as imparting benefits to themselves or others. As one World War II combat veteran stated; "the deepest fear of my war years, one still with me, is that these happenings had no real purpose" (Gray, 1959).

Janoff-Bulman (1992) describes three types of cognitive constructs that impart benefits to traumatic event: lessons about life, lessons about the self, and benefits to others. Learning lessons about life involves perceiving the trauma as containing a spiritual or moral message. For example, a young man who had survived attempted murder stated:

After they stabbed me and left me for dead, I suddenly had a very powerful image of my father. I realized I couldn't die yet because it would cause him too much grief. I had to reconcile my relationship with him...I felt that I had been given a second chance at life (Herman, 1992).

Learning lessons about the self involves becoming more aware of one's existing capabilities or developing new positive attributes. Some survivors develop a new appreciation for the courage, dignity, or resilience with which they responded to the trauma. As a sexual abuse survivor interviewed by Silver et al. (1983) remarked, "I learned over the years that nothing as bad as what I had already been through was going to happen again. Now I know there is virtually nothing I can overcome."

Perceiving benefits to others involves interpreting one's suffering as promoting the welfare of other people or of future generations. For example, Herman (1992):

And just as they [heroes from the past] had influenced the conduct of individuals in many lands and over many centuries, so I, too, with my decisions and choices had the power to inspire or disenchant those who had existed in the past as well as those who would come in the future.

The social and interpersonal context is presumed to play an important role in cognitive reconstruction. "Those closest to the victim provide the most potent data available about the nature of the world and the worth of the individual victim, at the time when a victim is particularly sensitive to such information" (Janoff-Bulman, 1992). In other words, the responsiveness of others can help to restore the survivor's self-esteem, trust in others, and hope for a better future. On the other hand, interactions with people who are insensitive or indifferent to the victim's suffering can impede the survivor's attempts at cognitive reconstruction (Masters, Friedman, & Getzel, 1988; Wortman & Dunkel-Schetter, 1979).

Janoff-Bulman's theory extends Horowitz's account of the cognitive integration process by suggesting three specific cognitive schemas that traumatic events can disrupt. This theory can account for the variability in trauma response among individuals exposed to the same event. Individuals who are able to reappraise the trauma in ways that preserve self-worth, hope and a sense of control over future outcomes should adapt more successfully than those who maintain a fixed, negative view of the trauma. Delayed forms of PTSD can be explained in terms of survivors' newly reconstructed world views being assaulted by subsequent stressors. The presence of negative symptoms, such as anhedonia, depression, and alienation in some trauma survivors, can be explained in terms of the loss of meaning and disillusionment that may result from the rupture of previous worldviews and the failure to develop a meaningful alternative perspective.

Jones and Barlow's Trauma Response Theory

Jones and Barlow created an etiology of PTSD that focuses on biological and psychological vulnerability. Their model includes consideration of the role of negative life events, alarms (fear reactions), perceptions of control, social support, and coping strategies. Research shows there is a biological component in an individual's risk of developing PTSD after experiencing a traumatic event. Foy et al. (1987) examined the prevalence of psychiatric illness in families of combat veterans with PTSD and without PTSD. In two separate subject families, they found the fare of familial

psychopathology in PTSD veterans to be 48% and 71%. In the group without PTSD, the corresponding rates were 35% and 50%. An interesting finding emerged once both familial psychopathology and degree of combat exposure were addressed simultaneously. In a series of conditional probability calculations, they found that veterans with high combat exposure and the presence of familial psychopathology were most likely to have a PTSD diagnosis. Veterans with low combat exposure and no familial psychopathology had the lowest risk. They interpret these results in the context of a threshold in the etiology of PTSD. That is, under conditions of high combat exposure, familial predisposition is of little significance. However, low combat exposure may be sufficient to precipitate the onset of PTSD if a familial predisposition to psychopathology exists.

Similar to biological predispositions, psychological vulnerabilities are thought to mediate the development of anxiety disorders. Although still at an early stage in its development, accumulating research, both with animals and humans, is beginning to demonstrate that variables embraced under this rubric play a role in the etiology of anxiety disorders. Such variables include prior experience with a sense of control over life events and social support (Barlow, 1988).

Mineka (1979) and others have contended that prior experience with control attenuates the negative effects of later uncontrollable and unpredictable aversive events. Uncontrollability has been identified as an important mediator in the development and maintenance of anxiety and stress disorders (Barlow, 1988 as cited in Prins, 1996). It appears that psychological vulnerability may manifest itself in precepts of unpredictability (it might happen again) and uncontrollability (I may not be able to cope). As such, it is a component important to entrance into the feedback loop of anxiety. Furthermore, the sense of uncontrollability may be mediated by such variables as coping skills and social support.

The construct of "locus of control" has been one attempt at measuring different dimensions of control (Rotter, 1966). Internal locus of control is thought to reflect an individual's belief of control over his or her environment. Obversely, external locus of control is reflective of feelings of no control. A 2001 study by Martin found that learned helplessness and external locus of control were significantly positively correlated with each other. Whether or not an individual believes they have control over their life, their own actions, and perhaps the things that happen to them, will have great effect on how they handle stressful situations and traumatic experiences.

Pennebaker's Trauma Response Theory

Pennebaker and colleagues created a theory of self-disclosure and confession. The idea that actively holding back from expressing strong emotions may have deleterious effects on physiological and psychological functioning has long been popular within psychology. Early writers, such as Breuer and Freud, proposed that the roots of hysterical patients' symptomatology lie in unconscious "strangled affect" associated with the repressed memories of past traumas. An important component of this line of thinking is that reviving memories of past upsetting experiences and their associated emotions has preventative and curative effects (Greenberg & Stone, 1992).

A theory of inhibition and psychosomatic disease suggests that the failure to confide traumatic events is stressful and associated with long-term health problems. The

central assumption of this theory is that inhibition of thoughts, feelings and behavior is an active process requiring physiological work. When individuals inhibit their desire to talk or think about traumatic experiences over long periods of time, cumulative stress is placed on the body, resulting in increased vulnerability to stress-related diseases. An important corollary of inhibition theory is that disclosure related to past traumatic experiences should reduce the likelihood of negative health outcomes (Greenberg & Stone, 1992). Pennebaker et al. did an experiment to test short-term autonomic correlates of disclosing personal and traumatic experiences among two samples of healthy individuals. They measured skin conductance, blood pressure and heart rate.

Confession and self-disclosure are basic processes that occur in psychotherapy, religion and naturally occurring social interaction. All things being equal, confiding significant experiences is considered psychologically and, perhaps, physically beneficial. According to the developing inhibition--disease framework, the act of inhibiting or otherwise restraining ongoing behavior, thoughts and feelings requires physiological work. Whereas short-term inhibition is associated with brief increases in specific autonomic activity, long-term inhibition places additional stress on the body, resulting in increased rates of illness and symptom reports. A particularly relevant form of inhibition is the need to discuss an important event of feeling but not being able to do so. Pennebaker et al. believe that if the event is eventually disclosed, the individual can--at least temporarily--reduce the work of inhibiting and thus lower the stress placed on his or her body. If the failure to discuss traumatic or stressful events is physiologically harmful, it would follow that disclosing these events should be beneficial.

Litz and Keane's Trauma Response Theory

Litz and Keane (1989) created a trauma response theory using an information-processing model. They believe it is likely that selective attention, response bias, and retrieval sensitivity (which vary with the quantity and quality of retrieval cues present at a given point in time) play a big part in the development of PTSD. Storage of fear-related (trauma) information is organized in memory in a multidimensional network which facilitates attention, potentiates behavioral responses, and induces psychophysiological responses to threat cues. Stimulus cues activate trauma-related networks in memory originate in the environment and form internally generated cognitive events in the form of self-talk, intrusive thoughts and images, cognitive appraisal of arousal states, or internally experienced physiological states.

Information related to the trauma is available from memory but not readily accessible for recall. This is either due to conscious and effortful, or unconscious and automatic avoidance of the aversive nature of such recollected events and/or due to the fact that appropriate retrieval cues are not present in the environment or in the internal milieu at the time of recall. The aversiveness of memories related to the trauma lead to a motivation state (e.g., anxiety) fostering avoidance strategies (cognitive or motoric) that reduce the likelihood of retrieval of such threatening cues, thereby reducing aversive states. One of the cognitive avoidance strategies may come in form of a response bias. PTSD subjects may likely set a lenient response criterion for recognizing, for example, generic threatening information (not directly relevant to the trauma) at the expense of being able to accurately identify specific trauma-related information that may be more anxiety producing and thus more threatening.

Given the right set of retrieval cues, a given subject with PTSD should be able to recall or recognize trauma-related information accurately and readily. Mood state or arousal can act as a retrieval cue in subjects with PTSD. However, when PTSD subjects are either not aroused and/or there are few retrieval cues present at the time of retrieval, memory for trauma-related material will suffer.

PTSD is also associated with a readiness to attend to trauma-related stimuli in the environment. This entails a selective or biased attention to trauma cues which can be operationally defined in various ways. Trauma cues receive differential (selective) attention and serve to inhibit reaction times to an ongoing task. Selective attention and memory reactivation of trauma cues in PTSD is mediated, in part, by psychophysiological responsivity. This increased arousal, as measured by heart rate and skin conductance, will accompany presentation of trauma-related stimuli in subjects with PTSD.

Litz and Keane find the exposure to any related cue (e.g., a man on a date for a rape survivor) in the environment may activate the relevant network leading to hypervigilance, misinterpretation of approach on the part of the date, an increase in arousal, images of the rape scene, and a conscious effort to avoid the aversive memories which would subsequently increase in their likelihood of retrieval due to the fact that rich retrieval cues would become more and more active as time passes. However, further active suppressions of recall of such painful cues coupled with active behavioral avoidance may serve to reduce arousal and thus reduce the presence of these avoidance behaviors. Such information processing variables may also account for the reexperiencing phenomena (or what might be labeled cued memory reactivation) that can at times shift to avoidance phenomena reduced memory sensitivity due to cognitive and behavioral avoidance as seen in PTSD. Cognitive avoidance strategies (distracting ones thoughts) would reduce the presence of internal retrieval cues, while behavioral avoidance strategies (not going to a setting reminiscent of the trauma) would reduce the presence of external retrieval cues.

Discussion

The exact factors that influence an individuals' response to trauma have not yet been set in stone, however, there are several factors that seem to carry a great deal of weight with respect to trauma response. Using the concepts described in the five trauma response theories discussed above, I would like to propose what I believe to be the major factors involved in how an individual reacts to a traumatic experience. These factors include personality type, support networks, past traumatic experience and general stress level. These four multi-dimensional factors are the major contextual components determining if nightmares will be therapeutic or not. These factors are not mutually exclusive, but most individuals will have one factor that carries more weight than another.

Some research suggests personality type plays a role--your personality determines how anxious you are in general, and how you deal with stress on a day-to-day basis, and thus, will play a critical role in how an individual will experience the aftereffects of a traumatic event (Picchioni et al., 2002). There is also research suggesting perception of support networks is crucial in the recovery process. It appears if an individual perceives themselves to have a very functional, very effective support

network, they are more likely to return quickly to normal functioning and to see their intrusive thoughts and dreams as a means of 'therapy'; whereas those who feel they are on their own, and do not perceive themselves as having a support system, are much more likely to become very anxious and be further traumatized by the ruminative thoughts and nightmares (Picchioni et al., 2002, Bal et al., 2003, Kaspersen, 2003 & Nolen-Hoeksema & Davis, 1999). Receiving positive social support after a traumatic experience generally is related to better adjustment to the trauma. The personality of trauma survivors may affect the extent to which they seek social support, their perceived receipt of social support, and the extent to which they benefit from social support. Nolen-Hoeksema and Davis (1999) say that people with a ruminative coping style, who tended to focus excessively on their own emotional reactions to a trauma, compared to those without a ruminative coping style, would seek more social support, and would benefit more from social support, but would report receiving less social support.

Past traumatic experiences and general stress levels can play a critical role in trauma response, because it can play the role of the 'straw that broke the camel's back' (Jones & Barlow, 1990). If an individual is recovering from a past traumatic experience or is generally 'stressed out,' it is much more likely they will have a maladaptive reaction to trauma than a person who for all intents and purposes is stress free. Individuals differ in the psychological strength prior to trauma. This variance in strength will be a major factor in the individual's response to trauma.

Future Research

In the future, I hope to continue research in this field. Throughout my Ph D. course work I aspire to take all the above-mentioned information and do further research to discover more precisely what roles these factors do hold and exactly how mutually exclusive they are in reality. I hope to look more closely at personality types and certain personality disorders, finding more precisely what sub-factors within personality lead an individual to normative or maladaptive reactions to trauma as well as conducting further examination of the support systems and how they become known. What effect does the 'perceived' existence of a social network have on the individual--e.g., if a person truly does have a large, functional social support network, but perhaps has personality factors, or mental disorders, that leads them to believe they are lacking social support and in fact don't have anywhere to turn. What things can a social support network do to be more available to the trauma survivor? To test trauma and stress levels, I plan to look more closely at exactly what differentiates one stressor from another, making one stressor traumatic, and another not. I would like to examine if there are certain factors, certain chemicals, perhaps certain neurotransmitters that if present in higher or lower than 'normal' levels trigger activity in the brain creating ruminations/nightmares. It would be interesting and helpful to find out also if there are demographic factors that any influence on trauma response (e.g., age, gender, race, religion, socio-economic status, marital status).

To truly understand what goes on with-in a human body after experiencing a traumatic event it requires doing a full examination of cognitive, emotional, behavioral, hormonal, and physiological factors. In the past trauma research has been done by examining one aspect of trauma to the exclusion of all others; I hope to create a comprehensive, multi-faceted trauma model that will take into account that multiple factors can play a critical role in trauma response. Perhaps with the

creation of such a model there would be further insight as to what types of therapy and interventions would be helpful and effective for trauma survivors to better cope with their traumatic experience.