Editor's Foreword • Bruce Greyson, M.D.

ARTICLE

The Acute Dying Experience • Michael B. Sabom, M.D.

LETTERS TO THE EDITOR

• P. M. H. Atwater, L.H.D. • Michael B. Sabom, M.D. • Neal Grossman, Ph.D.
• Keith Augustine, M.A.
Editor's Foreword 179
Bruce Greyson, M.D.

ARTICLE 181
The Acute Dying Experience
Michael B. Sabom, M.D.

LETTERS TO THE EDITOR 219
P. M. H. Atwater, L.H.D.
Michael B. Sabom, M.D.
Neal Grossman, Ph.D.
Keith Augustine, M.A.
Editor’s Foreword

This issue of the Journal features a major conceptual analysis by cardiologist and near-death research pioneer Michael Sabom of what he calls the “acute dying experience,” a phenomenon that may precede a near-death experience (NDE) but is distinct from it. In a series of articles some thirty years ago that presaged the study of what later became known as NDEs, psychiatrist Russell Noyes and his colleagues described the subjective response to life-threatening danger as including three clusters of effects: depersonalization, hyperalertness, and mystical consciousness. Sabom has updated the description of the confrontation with sudden death in light of recent research into peritraumatic dissociation. He distinguishes the acute dying experience, characterized by dissociation and hyperarousal that overlap with Noyes’s depersonalization and hyperalertness clusters, from the NDE, which is characterized by Noyes’s third cluster, mystical consciousness. In light of ethological observations of predator-prey interactions, Sabom views the acute dying experience as an adaptive response that promotes survival. Distinguishing acute dying experiences from NDEs may help scholars resolve some of the confusion and debate about etiological factors contributing to NDEs.

We also include in this issue letters from near-death experiencer and author P. M. H. Atwater on apparent embellishment of NDE accounts over time, from Sabom clarifying his landmark report of veridical out-of-body perception during cardiac resuscitation, from philosopher Neal Grossman on errors common in skeptical arguments, and a reply from philosopher Keith Augustine offering a contrasting perspective on skeptical critiques.

The next issue of the Journal of Near-Death Studies will be the last one for which I will serve as editor. For the past few years, I have contemplated stepping down as editor of the Journal as my life and career enter new phases, and I have been seeking, with the help of the IANDS Board of Directors, a successor who would uphold the scholarly standards of the Journal yet take it in new directions. I am delighted to announce that counseling educator Janice Miner Holden, IANDS’s former President, has agreed to take on that responsibility.

Bruce Greyson, M.D.
The Acute Dying Experience

Michael B. Sabom, M.D.
Atlanta, GA

ABSTRACT: The acute dying experience (ADE) incorporates peritraumatic dissociation and hyperarousal (for example, speeding thought, narrowing and sharpening of perception, and preparation for action) into an experiential continuum lasting seconds to minutes. It is instantly triggered by the sudden, clear perception of threat of significant injury and/or death and followed, at times, by physical trauma, physiological derangement, and loss of consciousness. Peritraumatic dissociation was diagnosed in 83 percent of survivors of 52 life-threatening accidents. Depth of peritraumatic dissociation correlated positively with subject’s severity of injury (p < .05), loss of consciousness (p < .05), perceived certainty of death (p = .055), and hospital treatment (p = .10). Eighty-four percent of injured subjects felt no immediate pain regardless of severity of injury. Absence of emotion accompanied minor injury; a feeling of peace predominated with more severe trauma. The ADE mirrors the three-phase response of perception, defense, and recuperation observed during predator-prey interaction in animals. It appears to be an adaptive response that promotes survival by holding paralyzing emotions in abeyance, increasing mental alertness, and blocking disabling pain. Results from this and other studies show that paradoxically the more terrifying and traumatic an accident may appear, the more peaceful and painless it may actually be experienced.

KEY WORDS: acute dying experience; peritraumatic dissociation; hyperarousal; adaptive response; endorphins.

“If when directly before the gate of death, consciousness flashes up in marvelous fiery ardour, like a mountain peak before the fall of night, it does so not from a singular perfection of power or highest ideational creation, but rather from a quiet experience that passivity of feeling fills with the highest aesthetic values.”

The DC-10 had lost all hydraulics and the pilots on United Air Lines Flight 232 had only the power of the left and right engines to control the aircraft as it approached Sioux City, Iowa, on July 19, 1989. According to the National Transportation Safety Board:

The aircraft approached with a high sink rate (1620 feet/min for the last 20 seconds) at an airspeed of 215 knots. [Normal sink rate is 300 feet/minute and airspeed 140 knots at touchdown in a DC-10.] At 100 feet above the ground the nose began to pitch downward and the right wing dropped. (http://aviation-safety.net/database/record.php?id=19890719-1, accessed 04/17/07)

"Well, we started to go over. I was like, I don’t want to do this. I know this airplane is starting to roll” recalled Jan Brown-Lohr, Senior Flight Attendant on Flight 232 (Survival in the Sky, 1996).

“The plane touched down on the threshold slightly left of the centreline, skidded to the right and rolled inverted. The DC-10 caught fire and cartwheeled” (http://aviation-safety.net/database/record.php?id=19890719-1, accessed 04/17/07).

Brown-Lohr remembered these critical moments: “I couldn’t hear anything, I couldn’t feel anything, I couldn’t smell anything, nothing was working except my mind; it was like total body detachment, or, or, being in a protective cocoon” (Survival in the Sky, 1996). The aircraft broke up, igniting into a huge fireball. Brown-Lohr reported that she then realized that two-thirds of me was suspended in fire and I felt, this is, this is it, this is how I’m going to go, this is how I’m going to die, and it was the most incredibly peaceful moment I’ve ever known, that I was in no pain. I had no fear anymore, it was total peace. (Survival in the Sky, 1996; emphasis added)

The burning wreckage came to rest upside down with the fuselage on its back. One hundred eleven people died by eventual count.

A recent review of the literature found limited research on the acute experience of dying, most studies having been conducted in people dying of chronic illness such as cancer (Kayser-Jones, 2002). These studies found that “depression, loneliness, fear, constipation, isolation, anxiety, edema, anorexia, insomnia and fatigue” frequently accompany the dying experience, despite modern medical advances (Kayser-Jones, 2002, pp. 13–14). In the last three days of life, 40 percent of chronically ill patients suffer severe pain most of the time, 80 percent experience severe fatigue, and 63 percent have difficulty tolerating their physical or emotional symptoms (Lynn, Teno, Phillips, Wu, Desbiens, Harrold, Claessens, Wenger, Kreling, and Connors, 1997).
As one 62-year-old woman dying of breast cancer put it: “Every part of my body hurts. . . . It’s more painful than childbirth. It grabs on and won’t go. . . . Sometimes the pain is unbearable. . . . It gets so bad that I try not to move. I get so tense! . . . Dying is hard” (Kayser-Jones, 2002, p.13).

In contrast to the discomforting days to weeks of the chronic dying experience, dying acutely as in Brown-Lohr’s case takes seconds to minutes and is reported to be “subjectively a very pleasant death” (Heim, 1892, trans. in Notes and Kletti, 1972, p. 51), accompanied by “emotionally comforting images” (Pfister, 1930, trans. in Kletti and Noyes, 1981, p. 6) that allow us “to face life’s end with serenity, even acceptance” (Noyes and Kletti, 1976a, p. 27). This acute dying experience (ADE) consists of 2 main components: psychological dissociation and heightened arousal, which includes speeding thought, narrowing and sharpening perception, and preparation for action. It may be followed by a mystical or transcendental experience, that is, a near-death experience (Greyson, 1998), particularly in persons encountering “a more serious threat to life” (Noyes, 1979, p. 82) and “unconsciousness” (Sabom, 1982, p. 7; 1998, p. 32).

Dissociation is a cognitive and affective “disruption in the usually integrated functions of consciousness, memory, identity, or perception” (American Psychiatric Association, 2000, p. 519). Dissociation at the time a traumatic event is unfolding is defined by the new concept of peritraumatic dissociation, which

may take the form of altered time sense, with time being experienced as slowing down or rapidly accelerated; profound feelings of unreality that the event is occurring, or that the individual is the victim of the event; experiences of depersonalization; out-of-body experiences; bewilderment, confusion, and disorientation; altered pain perception; altered body image or feelings of disconnection from one’s body; tunnel vision; and other experiences reflecting immediate dissociative responses to trauma. (Marmar, 1997, p. 1)

Psychological instruments have been developed to measure peritraumatic dissociation (Marmar, Weiss, Schleenger, Fairbank, Jordan, Kulka, and Hough, 1994).

These two components of the ADE occur within an experiential continuum lasting seconds to minutes beginning with sudden, clear perception of threat of significant injury and/or death and followed, at times, by physical trauma, physiological derangement, and loss of consciousness. It is not a near-death experience (NDE) as currently defined in that it is not transcendental or mystical (Greyson, 1998, p.
14). Some who have ADEs may also have NDEs, but that involves an extension or something more. ADEs include peritraumatic dissociation, but is more than that, since hyperarousal is not part of this dissociative response. Peace and painlessness commonly occur during the experience, followed by overwhelming emotion and pain after the threat has passed. It has adaptive potential in the acute situation, but this potential may later be overwhelmed and lead to psychiatric disorders, such as acute stress disorder or posttraumatic stress disorder. Thus, the ADE is a subjective response to threat of death including dissociation and hyperarousal that, with the removal of the threat, is replaced by delayed emotional and cognitive response to the threat.

This essay examines this new concept of the ADE as experienced by survivors of life-threatening or serious accidents. I will discuss adaptive aspects of peritraumatic dissociation in relation to the perceptual-defensive-recuperative response to threat observed in animals during predator-prey interaction (Bolles and Fanselow, 1980). Results show that the emotional, psychological, and physical experience of sudden and unexpected death is not the dreadful event that people might suppose, even in the presence of severe traumatic injury, with or without an NDE.

The Accident Study

Methods

I approached 110 patients from an internal medicine and cardiology practice at the end of consecutive, regularly-scheduled office visits for routine medical care. I asked each whether he or she could clearly recall having survived a serious, life-threatening accident for which there was no pending litigation. The litigation exclusion was to avoid "compensation neurosis," which has been found to influence self-report of accident injuries (Comes, 1992). I also excluded minor motor vehicle accidents.

Forty-six patients recalled one or more qualifying accidents and were recruited for the study. I also recruited three additional serious accident survivors from my previous research: a pilot who fell 15,000 feet into the ocean from a burning aircraft, a Vietnam veteran with a battlefield injury, and a flight attendant who survived a terrorist attack. For the five participants recalling more than one
qualifying accident, I included only the most severe in each category, such as accidents involving motor vehicles, near-drownings, aircraft, or other circumstances. I obtained written, informed consent from all participants.

During tape-recorded, follow-up interviews, participants gave detailed narratives of the accidents, including duration (that is, estimate of time elapsed between initial realization of imminent danger and completion of accident), loss of consciousness, and hospital treatment. They also reported their position in motor vehicle accidents (that is, driver or passenger) and an estimate of the terminal closing speed between the participant’s vehicle and the object of impact.

Participants described all physical injuries received during the accident, and estimated threat to life using a self-report version of the Abbreviated Injury Scale (AIS), a widely-used, injury-severity instrument that measures immediate threat to life on a 0 to 6 scale (Committee on Injury Scaling, 1985). I used for this study the highest AIS value of all injuries – the maximal (MAIS) value – as single injury scores such as the MAIS predict mortality better than scores based on multiple injuries (Kilgo, Osler, and Meredith, 2003). MAIS scores predict survival rates of 100 percent for MAIS 0, indicating no injuries; 93 percent for MAIS 1, indicating “minor” injuries such as abrasions, facial lacerations, and arm contusions; 99.6 percent for MAIS 2, indicating “moderate” injuries, such as multiple fractured ribs, fractured collar bone, concussion with loss of consciousness, or facial trauma with loss of four teeth; 98 percent for MAIS 3, indicating “serious” injuries, such as broken back requiring body cast for 6 weeks, near-amputation of life leg, bilateral femur fractures, or compound fractures of both legs; 94 percent for MAIS 4, indicating “severe” injuries involving massive organ injury; 73 percent for MAIS 5, indicating “critical” injuries involving a spinal cord syndrome or crushed limb; and 16 percent for MAIS 6, indicating “fatal” injuries such as a crushed skull or chest (Clarke, Ragone, and Greenwald, 2005).

Persons with MAIS 1 injuries had a higher mortality rate than those with MAIS 2, 3, or 4 because those dying without diagnostic workup or autopsy were coded on the basis of external injuries only, which led at times to an artificially low MAIS score (Clarke, Ragone, and Greenwald, 2005). Moreover, the MAIS, which is based on detectable morphologic derangement, does not recognize nonanatomic, physiologic injuries such as intoxication, submersion in water, and suffocation (Adams and
Carrubba, 1998). To correct for this in estimating threat to life, I used a modified version of MAIS in two cases: one case of transient suffocation from strangulation with minimal abrasion to the neck and another with loss of consciousness from inhalation of toxic fumes with minor superficial burns. I upgraded threat to life in both of these cases from MAIS 1 to MAIS 3 levels.

Participants scored their level of physical pain at the moment of injury on a scale of 0 (no pain) to 10 (worst pain ever felt), and again at its (later) maximal intensity. I measured participants' perception of life threat by asking: "During the accident how certain were you that you were going to be killed, with 1 being completely certain that you would not be killed and 10 being completely certain that you would be killed?" Each participant scored peritraumatic feelings of peace, fear, and horror as absent, present, or strongly present.

I diagnosed peritraumatic dissociation using the self-report version of the Peritraumatic Dissociative Experiences Questionnaire (PDEQ-SR), a widely-used, 10-symptom inventory that is "internally consistent, strongly associated with measures of traumatic stress response, strongly associated with a measure of general dissociative tendencies, strongly associated with level of stress exposure, and unassociated with measures of general psychopathology" (Marmar, 1997, p. 2; see Table 1). I gave each participant explicit written instructions to "Please respond to the items by describing your experiences and reaction at the time of this accident. We are not talking about how you are feeling now; rather, we want you to think back to how you were feeling at the time the trauma was taking place" (Panasetis and Bryant, 2003, p. 564). Participants rated each item on a 5-point Likert scale (5 = extremely true; 4 = very true; 3 = somewhat true; 2 = slightly true; 1 = not at all true) according to the extent to which they experienced the symptom.

I calculated the mean item response score across all items on the PDEQ-SR, with possible scores ranging from 1 to 5. Scores of 1.5 or lower are considered not to represent clinically meaningful dissociation; scores above 1.5 are considered diagnostic of peritraumatic dissociation (Marmar, Weiss, Metzler, and Delucchi, 1996). If physical injury had occurred, I added an eleventh symptom ("I felt surprisingly little or no pain immediately at the time of my injury") and scored it separately.

I analyzed data with Pearson's correlation coefficient using Microsoft Office Excel 2003, using a p value of .05 (two-tailed) as the level of significance.
Results

Thirty-four men and 13 women (47 of 49 initial participants) completed the PDEQ-SR and were included in the study. These participants recalled 52 qualifying accidents involving motor vehicles (N = 38), falls (N = 5), near-drownings (N = 2), aircraft (N = 2), or other circumstances (N = 5). Participants in motor vehicle accidents were drivers (N = 27), front seat passengers (N = 9), or back seat passengers (N = 2). Age at the time of the accident ranged from 8 to 70 years (mean = 34) and at time of interview from 41 to 82 years (mean = 62). Duration of the accident ranged from less than 1 second to 1320 seconds, with 83 percent lasting 10 seconds or less. Terminal closing speed in motor vehicle accidents ranged from 20 to 100 miles per hour (mean = 50).

Thirty-one accidents (60 percent) resulted in physical injury and 23 (44 percent) in hospital treatment. Loss of consciousness resulted from head trauma (N = 5) and breathing toxic fumes (N = 1), and lasted from less than 1 second to 120 seconds. All injuries were rated at a MAIS 3 or less in severity. This relatively infrequent occurrence of severe, critical, or fatal physical injuries is consistent with other general accident surveys (Jeavons, Greenwood, and Horne, 2000; http://www.me.vt.edu/gabler/publications/Development%20of%20Acceleration%20Based%20Injury%20Criteria_Final2.pdf, accessed 04/18/07).

Peritraumatic dissociation occurred in 43 of the 52 accidents (83 percent). Five peritraumatic dissociative symptoms from the PDEQ-SR were reported during more than half of accidents: “event seemed to happen in slow motion”; “event seemed unreal, as in dream or play”; “found self acting on ‘automatic pilot’”; “not aware of things that happened”; and “felt confused.” As noted in Table 1, the remaining peritraumatic dissociation symptoms were endorsed by 13 to 44 percent of accident victims.

PDEQ-SR scores showed a statistically significant positive correlation with MAIS level of injury ($r = .314, p < .05$) and with loss of consciousness ($r = .312, p < .05$); and a nonsignificant positive correlation with hospital treatment ($r = .229, p = .10$). A positive correlation of PDEQ-SR scores with participants’ subjective rating of certainty of death approached significance ($r = .269; p = .055$). As shown in Table 2, none of the remaining demographic and accident variables were significantly associated with PDEQ-SR scores.

Peritraumatic feelings of peace, fear, and horror showed little relationship to minor injuries with MAIS $\leq 2$. As shown in Table 3, a feeling of peace predominated in those experiencing MAIS 3 injuries.
Table 1

<table>
<thead>
<tr>
<th>Peritraumatic Dissociative Experiences Questionnaire – Self-Report Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbreviated Symptom Description</td>
</tr>
<tr>
<td>Events seemed to happen in slow motion</td>
</tr>
<tr>
<td>Event seemed unreal, as in a dream or play</td>
</tr>
<tr>
<td>Not aware of things that happened</td>
</tr>
<tr>
<td>Found self acting on “automatic pilot”</td>
</tr>
<tr>
<td>Felt confused</td>
</tr>
<tr>
<td>Moments of losing track or blacking out</td>
</tr>
<tr>
<td>Felt disoriented and uncertain where I was</td>
</tr>
<tr>
<td>Felt as if floating above scene as spectator</td>
</tr>
<tr>
<td>Felt disconnected from body or body distorted</td>
</tr>
<tr>
<td>Felt what happened to other was happening to self</td>
</tr>
</tbody>
</table>

Twenty-six of the 31 injured participants (84 percent) experienced no pain (level 0) at the time of the injury, yet 27 (87 percent) experienced moderate to severe pain (mean level 6.37) minutes to hours later. All injured participants endorsed the statement “I felt surprisingly little or no pain immediately at the time of my injury,” with levels of endorsement at “slightly true” (N = 1), “somewhat true” (N = 4); “very true” (N = 13), and “extremely true” (N = 13).

The Acute Dying Experience

Peritraumatic Dissociation

Russell Noyes and Roy Kletti (1977) reported the first scientific study of dissociative symptoms occurring during life-threatening events. They studied 101 survivors (median age = 22 years) of automobile accidents, drownings, miscellaneous accidents, and serious illnesses using a 40-item questionnaire calling for “yes” or “no” answers to questions concerning their life-threatening experiences and depersonalization, a type of dissociation characterized by a feeling of detachment or estrangement from one’s self. Sixty-six percent reported “five or more of these depersonalization symptoms pointing to the extremely frequent appearance of this adaptive mechanism under dangerous circumstances” (Noyes and Kletti, 1977, p. 383). Symptoms
Table 2
Correlation of Demographic and Accident Variables with Peritraumatic Dissociation Experience Questionnaire – Self-Report (PDEQ-SR) Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at time of accident (years)</td>
<td>-.190</td>
</tr>
<tr>
<td>For motor vehicle accident (MVA): 0=passenger, 1=driver</td>
<td>-.127</td>
</tr>
<tr>
<td>Subject rating of immediate pain: 0=none . . . 10=worst ever felt</td>
<td>-.076</td>
</tr>
<tr>
<td>Gender: 0= male, 1= female</td>
<td></td>
</tr>
<tr>
<td>Interval between accident and interview interval (years)</td>
<td>.016</td>
</tr>
<tr>
<td>Type of accident: 0 = MVA, 1 = other</td>
<td>.053</td>
</tr>
<tr>
<td>Estimated duration of accident (seconds)</td>
<td>.143</td>
</tr>
<tr>
<td>Estimated terminal closing speed for MVA (miles per hour)</td>
<td>.157</td>
</tr>
<tr>
<td>Subject rating of perceived certainty of death: 1=none . . .</td>
<td>.269</td>
</tr>
<tr>
<td>10=complete certainty</td>
<td></td>
</tr>
<tr>
<td>Actual threat to life:</td>
<td></td>
</tr>
<tr>
<td>Hospital treatment: 0 = no, 1 = yes</td>
<td>.229</td>
</tr>
<tr>
<td>p = .10</td>
<td></td>
</tr>
<tr>
<td>Loss of consciousness: 0 = no, 1 = yes</td>
<td>.312</td>
</tr>
<tr>
<td>p &lt; .05</td>
<td></td>
</tr>
<tr>
<td>MAIS&lt;sup&gt;a&lt;/sup&gt; level of injury: 0, 1, 2, or 3</td>
<td>.314</td>
</tr>
<tr>
<td>p &lt; .05</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Maximal Abbreviated Injury Scale.

were unaffected by age or gender. Noyes and Kletti concluded that “dissociation between an observing and a participating self was occurring under life-threatening circumstances” (1977, p. 384).

More recently, accident-induced or peritraumatic dissociation has been studied using validated versions of the PDEQ. Carol Fullerton and her colleagues (Fullerton, Ursano, Epstein, Crowley, Vance, Tzu-Cheg, and Baum, 2000) evaluated the experiences of 122 motor vehicle accident survivors using the observer-rated version of this questionnaire, the PDEQ-RV (Marmar, Weiss, Schlenger, Fairbank, Jordan, Kulka, and Hough, 1994), in which “clinicians rated subject responses to symptom probes: 0 = inadequate information, 1 = absent, 2 = subthreshold, and 3 = threshold. Peritraumatic dissociation was scored as present if at least 1 symptom was scored threshold” (Marmar, Weiss, Schlenger, Fairbank, Jordan, Kulka, and Hough, 1994 p. 268). Philippe Birmes and his colleagues (Birmes, Brunet, Benoit, Defer, Hatton, Sztulman, and Schmitt, 2005) used a French version of the PDEQ-SR to study experiences of victims of motor
Table 3
Physical Threat to Life

<table>
<thead>
<tr>
<th>Physical Threat to Life</th>
<th>MAIS a 0</th>
<th>MAIS 1</th>
<th>MAIS 2</th>
<th>MAIS 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of cases</strong></td>
<td>21</td>
<td>16</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td><strong>Pain:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate no injury</td>
<td>19%</td>
<td>22%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Later no injury</td>
<td>88%</td>
<td>89%</td>
<td>83%</td>
<td></td>
</tr>
<tr>
<td><strong>Peace:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>86%</td>
<td>87%</td>
<td>100%</td>
<td>33%</td>
</tr>
<tr>
<td>Present</td>
<td>10%</td>
<td>7%</td>
<td>0%</td>
<td>16%</td>
</tr>
<tr>
<td>Strongly present</td>
<td>4%</td>
<td>6%</td>
<td>0%</td>
<td>51%</td>
</tr>
<tr>
<td><strong>Fear:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>81%</td>
<td>63%</td>
<td>66%</td>
<td>67%</td>
</tr>
<tr>
<td>Present</td>
<td>14%</td>
<td>13%</td>
<td>34%</td>
<td>0%</td>
</tr>
<tr>
<td>Strongly present</td>
<td>5%</td>
<td>24%</td>
<td>0%</td>
<td>33%</td>
</tr>
<tr>
<td><strong>Horror:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>100%</td>
<td>94%</td>
<td>100%</td>
<td>68%</td>
</tr>
<tr>
<td>Present</td>
<td>0%</td>
<td>6%</td>
<td>0%</td>
<td>16%</td>
</tr>
<tr>
<td>Strongly present</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>16%</td>
</tr>
</tbody>
</table>

*Maximal Abbreviated Injury Scale.

vehicle accidents (N = 30), other serious accidents (N = 9), or interpersonal violence (N = 4).

The two most commonly endorsed PDEQ symptoms were the same in the present study and in these two recent studies just mentioned: “My sense of time changed – things seemed to be happening in slow motion” (endorsement range 56 to 87 percent) and “What was happening seemed unreal to me, like I was in a dream or watching a movie or play” (endorsement range 39 to 73 percent). Interestingly, these two symptoms were also the ones most commonly reported by Noyes and Kletti (1977), with each symptom endorsed by 72 percent of their sample of survivors of life-threatening circumstances.

Peritraumatic dissociation was diagnosed in 79 percent or more of participants in the present study as well as the studies by Fullerton and
colleagues and Birmes and colleagues, despite marked differences among these three studies in the time interval between the accident and the interview (see Table 4). Within The Accident Study itself, PDEQ-SR scores showed no correlation with accident-interview interval ($r = 0.016$), consistent with the report of others (Zoellner, Alvarez-Conrad, and Foa, 2002). Overall, this consistency of peritraumatic dissociation reporting over time comports with studies suggesting that memories of highly significant events are accurate and remain stable over time (Christianson, 1992; van der Kolk and Fisler, 1995).

**Individual Peritraumatic Dissociation Symptoms**

Participants in The Accident Study described clear examples of 9 of the 10 PDEQ symptoms (see Table 1) that are worth examining in detail.

"My sense of time changed – things seemed to be happening in slow motion." This was the most commonly reported symptom in all categories of accidents. While being struck head on during a motor vehicle accident, one man reported:

When she hit me, she was probably doing 45 mph. It literally picked my car up, spun it around, and somewhere in the process I smashed the whole windshield with my head... I was cut pretty badly.

I hit a telephone pole. I must have been a good 5 to 6 feet off the ground and slid down it... That was when time just seemed like it went on forever, from the time she hit me and I hit my head and until I hit the telephone pole and slid down. It just seemed like that went on forever... A long slow process which probably didn't last more than a second or two.

During a childhood near-drowning incident, a man remembered being rescued by his father:

He reached in, grabbed me by the hair, and pulled me out... I remember the time distortion very well. Afterwards I was talking with my father and told him, even though I was coughing, that time slowed down. He said “Yeah, that happens sometimes.”

After stepping on a land mine, a Vietnam veteran felt that “[e]verything slowed down to a point where, like Butch Cassidy and the Sundance Kid at the end of the movie, I saw myself coming out of this.” Others felt that “time went very slowly,” “time absolutely seemed to slow down,” “time seemed to stop,” and it “seemed like forever but it had to have been less than a second.”
<table>
<thead>
<tr>
<th>Study participants:</th>
<th>The Accident Study</th>
<th>Fullerton, et al.\textsuperscript{a}</th>
<th>Birmes, et al.\textsuperscript{b}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>47 (in 52 accidents)</td>
<td>122</td>
<td>42</td>
</tr>
<tr>
<td>Age at accident (± SD)</td>
<td>34.2 (± 17.4)</td>
<td>35.6 (± 13.1)</td>
<td>38.3 (± 13.1)</td>
</tr>
<tr>
<td>% male</td>
<td>74%</td>
<td>52%</td>
<td>44%</td>
</tr>
<tr>
<td>% injured</td>
<td>60%</td>
<td>91%</td>
<td>100%</td>
</tr>
<tr>
<td>Level of injury: MAIS\textsuperscript{c} 3 or less</td>
<td>not stated</td>
<td>not stated</td>
<td></td>
</tr>
</tbody>
</table>

| Interview: | | | |
| Time after accident | 28 years | < 2 weeks | 4.5 days |
| Instrument used | 10-item PDEQ-SR\textsuperscript{d} | 8-item PDEQ-RV\textsuperscript{e} | 10-item PDEQ-SR |

| PDEQ Results: | | | |
| Peritraumatic dissociation | 83% | 79% | > 90% |
| Most common items: | | | |
| Slowing of time | 87% | 56% | 73% |
| Events seemed unreal | 65% | 39% | 73% |
| Least common item: | | | |
| “Felt what happened to others was happening to self” | 11% | 0.8% | 21% |

| Correlated with age or gender | No | No | No |

\textsuperscript{a}Fullerton, Ursano, Epstein, Crowley, Vance, Tzu-Cheg, and Baum, 2000.
\textsuperscript{b}Birmes, Brunet, Carreras, Ducasse, Charlet, Lauque, Sztulman, and Schmitt, 2003.
\textsuperscript{c}Maximal Abbreviated Injury Scale.
\textsuperscript{d}Peritraumatic Dissociative Experiences Questionnaire – Self-Report.
\textsuperscript{e}Peritraumatic Dissociative Experiences Questionnaire – Rater Version.
“What was happening seemed unreal to me, like I was in a dream or watching a movie or play.” One man recalled “disbelief that this was actually happening” during a motor vehicle accident. Another felt during his high-speed motor vehicle accident that

[i]It seemed sorta strange, one of those things like “This really can’t be happening.” I remember the thoughts that kept going through my head were “This is not real. It’s just a dream. This can’t be happening. In a second I’m going to wake up and we’re going to be traveling down the highway.”

And while skidding out of control into oncoming traffic, a woman reported: “It was all so surreal at the time because you really don’t believe this is happening.”

A Marine pilot fell 15,000 feet into the Pacific Ocean after his parachute failed to open after he jumped from a burning aircraft. He experienced peritraumatic dissociation scoring 2.8 on the PDEQ-SR during this 2 minute and 24 second freefall at speeds of 75 to 80 miles per hour:

The only way I can describe it is if you had the most vivid dream that you ever had in your entire life, just absolute vivid dream, and somebody just shakes you awake and you realize you have gone from one plane to the next. . . . That was the strangest feeling that I have ever had . . . .

“I had moments of losing track of what was going on – I ‘blanked out’ or ‘spaced out’ or in some way felt that I was not part of what was going on” and “I was surprised to find out afterward that a lot of things had happened at the time that I was not aware of, especially things I ordinarily would have noticed.” Thirty-four participants endorsed one or both of these symptoms in the absence of physical loss of consciousness, suggesting a psychological lapse of awareness. Such was the case with a man after being distracted while riding his bicycle at high speed down a steep grade:

When I turned back to the road, there was a curve at that point and I knew that as fast as I was going down that hill that I would not be able to make that curve. . . . I thought to myself that I had to get my hands out because I knew that I was going to go down.

Within a period of one or two seconds, as soon as I made that conscious decision to tuck my head in and to get my hands out in front of me, my mind went completely blank. I just totally blacked out. When I did wake up was when I hit the ground on my back mainly on my right side. . . . Everything seemed to go black although I guess I didn’t lose consciousness because I hadn’t hit the ground yet.
"I found that I was on 'automatic pilot' – I ended up doing things that I later realized I hadn't actively decided to do." A feeling that movements or thoughts were mechanical or automatic was described during a near-fatal motor vehicle accident:

It was raining and I was driving a Volkswagen Beetle. I was going about 80 and I had just passed somebody. . . . The next thing I knew, my car was going in circles down the road. I couldn't gain control of it and it ended up going across the two lane road.

From the time I started spinning until the time it wound up on its side, it took maybe 4 seconds. . . . I had already determined that the situation was out of my control. I was not even trying to steer anymore.

I had a very heightened sense of awareness. It almost felt like someone else was driving, like someone else had taken over me for that very brief period of time. . . . It was at this point I was strictly a passenger in my own car. . . . I was very certain that I would be killed. . . . It was a very strange sensation.

"I felt confused; that is, there were moments when I had difficulty making sense of what was happening" and "I felt disoriented, that is, there were moments when I felt uncertain about where I was or what time it was." Most participants in The Accident Study described their ADE being, as one man put it, "very clear, very logical, very methodical." During taped interviews, the words "confused" and "disoriented" were used only once in descriptions of an ADE. A man recalled his experience after losing control of his car:

It just rolled down the slope of the embankment. The car rolled on its side. . . . I was a little disoriented. I was looking out the front windshield and I could see dirt, ground. I didn't realize that I was upside down. As I looked out the front window and saw this dirt I said "Hmmm, that's not correct. That's not right. I must be upside down." I didn't have a sense of being upside down until I knew I was.

Following life-threatening falls, alpine mountain climbers reported ADEs in which “[n]o confusion entered at all” (Heim, 1892, trans. in Notes and Kletti, 1972, p. 47).

The frequent endorsement of these two items regarding confusion and disorientation may reflect the difficulty and confusion resulting from attempts to integrate the dissociative experience mentally into an everyday sense of reality. Bruce Greyson noted that “emotional problems may arise from the difficulty in integrating them into the individual's usual consciousness” (2000, p. 463). As one survivor in
Noyes and Kletti's study described it, the experience was “not a part of reality. It is hard to explain” (1977, p. 380).

“I felt as though I were a spectator watching what was happening to me, as if I were floating above the scene or observing it as an outsider” and “There were moments when my sense of my own body seemed distorted or changed. I felt disconnected from my own body, or that it was unusually large or small.” A sense of detachment or separation from physical body was felt by this woman during a motor vehicle accident:

I was in the passenger side of a new Corvette. The top was down on the car and my boyfriend was driving. We were going around a curve about 60 on a four lane highway, not divided. We went into a skid because the brakes locked. There was nothing he could do. We slid across the oncoming traffic and missed all of it. I remember seeing the cars coming towards us and the feeling of the skid.

The car went down in the ditch, hit the side of the ditch on the left and came back and turned over spanning the ditch. I was under the car in the ditch. I was pinned at the chest. I was not able to get out.

As this was going on, it was kinda like my emotions were suspended and I was an observer. I was detached like I was watching a movie.

The driver of a car who barely missed hitting a sports car that had suddenly cut in front of him experienced a similar reaction:

I was going about 50 miles per hour. . . . It cut across several lanes in front of me and I kinda jerked the wheel. . . . The pickup truck I was driving started to spin around. When it stopped, I basically T-boned a retaining wall head on. It took 5 to 7 seconds for the whole thing. It was very quick. . . . It was sorta like I was looking at it and I wasn’t attached to it. I was an observer. Like it was happening to somebody else. . . . I was just observing it. It was like I was watching it on a monitor or something.

The Marine pilot whose parachute failed to open after he jumped from a burning aircraft recalled:

I was falling and working with the chute and just like that (snap of finger) I was 15 or 20 feet away watching me struggling. It was back and forth – bam, bam – here and then here and then here. . . . Two or three different times. I was there pulling on the risers and doing this and the next thing I know I was 15 feet away watching myself do it. . . . I just remember “In, out, in, out.” Two or three times. . . . It was real as could be.

During a terrorist attack that turned Pan American World Airways flight 110 into a burning inferno on December 17, 1973, this flight attendant sought refuge in the only two seats not yet on fire:
I crawled onto them. . . . That's when I had my experience. It was just all light. It was just incredible happiness and joy! It was indescribable. I saw myself. I was lying there in my uniform. I could see myself clearly through the smoke and I thought "Why aren't I moving?" There was fire everywhere. I thought "Why, why aren't I moving?" But I really didn't care because I was so happy where I was. . . .

And I am looking at myself and I'm lying there with my eyes closed because I couldn't breathe. All of a sudden a passenger screamed "Open the window. Somebody open the window. Help me!" I thought "I have to help that lady." The next thing I knew, I was back in my body.

"I felt as though things that were actually happening to others were happening to me – like I was being trapped when I really wasn't." This least-endorsed symptom was reported during 6 motor vehicle accidents. Three of these endorsements were at the minimally positive level of "slightly true." This symptom was not mentioned during taped interviews in The Accident Study, was not reported by Noyes and Kletti (1977), and was endorsed by only 1 of 122 participants (0.8 percent) in the study by Fullerton and colleagues (Fullerton, Ursano, Epstein, Crowley, Vance, Tzu-Cheg, and Baum, 2000). In the original description of the PDEQ, this item had the weakest relationship \( r = .41 \) with total score of the questionnaire (Marmar, Weiss, Schlenger, Fairbank, Jordan, Kulka, and Hough, 1994).

This was also the least-reported item in the study by Birmes and colleagues' study (Birmes, Brunet, Benoit, Defer, Hatton, Sztulman, and Schmitt, 2005). These researchers found that "deleting item 7 led to a more cohesive factor structure and increased the alpha [that is, internal consistency] by roughly 1% point." They concluded "that item 7 . . . taps onto a different or less frequent experience than the other items" (Birmes, Brunet, Benoit, Defer, Hatton, Sztulman, and Schmitt, 2005, p. 149).

**Hyperarousal**

Participants in The Accident Study frequently described an acceleration and sharpening of physical, mental, and visual perceptions consistent with the psychological state of hyperarousal. Perceived slowing of environmental time often accompanied these symptoms.

During the two seconds prior to a head-on collision with an oncoming Buick, a man perceived incredible visual detail:
It seemed like an eternity to me . . . I could see detail. I recall studying the hood of the old Buick he was driving. The emblem on an older Buick has three shields on it. I could almost count the ribs going across the shields themselves. I saw the little band of stars with little ribs on them.

What really catches my mind today more than anything is the first slat on his grille which was a horizontal slat on a grille. I could see through that and see the actual ribs of the radiator. I just remember that because to me they were not perpendicular, they were somewhat slanted like the radiator was in sideways or cockeyed. I will always remember the emblem and the ribs in that radiator turned just a tad off horizontal.

He was holding the wheel tight and turning. The older cars had a very large steering wheel. I could see the white knuckles holding the steering wheel. . . . Those things I remember more than anything.

A Vietnam veteran experienced acceleration of mental, physical, and visual perceptions after stepping on a land mine:

I took the next step with my right foot and when I did it happened. Everything slowed down to a point where, like Butch Cassidy and the Sundance Kid at the end of the movie, I saw myself coming out of this. I could feel myself being picked up, lifted out and in midair I could actually see coming out of the corner of my eyes this grey cloud. It was the outer perimeter of the fireball. I could feel my ear being blown open. I could feel my hand being released around the rifle. When I landed, I landed on my right side in a complete flat position. The first thing that I saw after it had cleared was Rick getting into a half crouching position. I could see him half way down. What took like that [snap of the finger] to happen, all of this occurred.

During his 15,000-foot free fall into the Pacific Ocean, the Marine pilot whose parachute failed to open reported vivid and detailed visual perception in his “out-of-body” state:

I was falling and working with the chute and just like that [snap of the finger] I was 15 or 20 feet away watching me struggling. I could remember vividly my orange flight suit, my helmet was yellow and had three big blue diamonds stenciled on it. . . . I can remember vividly seeing my boots. I had thought that I had boondockers on, low boots that we normally wore, and was surprised that I had on these brown high topped boots. I thought that that was just not right and it was in fact right. I did have on the high top boots. . . . The colors were vivid. It is almost like having an extremely vivid dream. I have never experienced it before or since.

Other typical comments included: “No longer than it took, I sure did think a lot”; and “I do remember a lot of the details for something that
happened in such a brief period of time, like my thoughts were speeded up.”

Predictors of Dissociation

Markers for severity of peritraumatic dissociation in The Accident Study included perceived threat to life as measured by participants' subjective rating of the certainty of death and actual threat to life as measured by MAIS level of injury, loss of consciousness, and hospital treatment. The threshold for peritraumatic dissociation was reached in 83 percent of participants. As shown in Table 2, participants' subjective rating of certainty of death and actual threat to life were associated (to varying degrees) with depth of peritraumatic dissociation.

As shown in Table 3, participants with MAIS 2 or less injury most commonly experienced an absence of peace, fear, or horror. This pattern comports with Noyes and Kletti's finding of a “blunting or absence of emotion” in 56 percent of their sample while facing life-threatening danger (1977, p. 378). Typical descriptions from The Accident Study include: “I don't remember feeling fear. The word peaceful is not the one I'm thinking of. What I am thinking of is more like relaxed”; “[I remember] being really very calm and saying 'Hmmm. So this is what it is like to die? It's not so bad’”; “I felt neutral - not scared”; “It was just so relaxing it was hardly anything I can describe. It was pretty close to peaceful but not from the standpoint I would call it that. More like a floating situation that I went into”; “I don't remember being afraid. It was kinda like my emotions were suspended and I was an observer”; and “I pretty much felt just a lack of emotion, like you were just involved with something and just had to ride it out.”

In participants with MAIS 3 injury, peace, fear, and, to a lesser degree, horror were more evident. Similar to the findings of Noyes and Kletti (1976a), when fear and horror were present, these were always the initial emotions, were short-lived, and were followed by a feeling of peace of equal or greater intensity. This woman in The Accident Study gave a typical description:

Our raft overturned. I was trapped in the “V” of the waterfall. I couldn't move or anything. The realization hit me that there is nothing I can do.

The very first reaction was I was terrified for about 2 seconds. Complete terror and panic. After the 2 seconds, I just sorta gave up. I
remember consciously thinking "there is nothing I can do, just give up."

That's when I started breathing water. I remember the water going down my lungs. There was no pain. I just started breathing water realizing that I was going to die. All I remember was that there was a white light. I didn't see any tunnel or anything. And this extraordinary feeling of total peace. I have never experienced that before — extreme peacefulness. It was just this overwhelming feeling.

I was completely certain that I would be killed. I resigned. I took three or four breaths of water and then it happened — the peace. It just lasted seconds. The next thing I knew was I was above water and they were trying to revive me.

A notable finding that emerged from The Accident Study was the complete absence of physical pain reported by 84 percent of injured participants. In the 16 percent who experienced pain during their accident, this pain was less severe than that felt afterward. During a motor vehicle accident going 45 miles per hour, a man remembered breaking his right hand and hitting his head on the windshield:

I did not experience any pain at least until a full minute afterwards. There was not much of a sensation of pain at all for the first minute after the accident. Afterwards, it was a 6 or 7 on a scale of 0 to 10. . . . I went to the hospital.

Another man recalled after breaking his collar bone: "I felt no pain when I immediately hit my back, but about 30 seconds later when I got up I had bad pain, a 7 to 8 on a scale of 0 to 10."

Still another man recalled no pain during this MAIS 3 injury:

I was jumping out of an airplane during Special Forces training and the static line got caught around my neck. I remember thinking "This is it. I'm dead. There is no way out of this." We called this a "towed trooper." I was towed for not more than 7 or 8 seconds. Time absolutely seemed to slow down. I was completely certain that I would be killed. I gave up. I was not scared at all and experienced resignation at the time. No physical pain. None.

During another MAIS 3 injury, a woman felt no pain when her back was severely broken, an injury that required 6 weeks of treatment in a full body cast.

I was probably going around 40. . . . Up ahead, something alerted me, something caught my eye. I saw something that wasn't normal. I think it was a car fishtailing. It hit the guard rail. . . . From that point it was in the slow motion type thing. . . . It was like slow motion. Gray, slow motion. It was just a floating feeling, like floating slow motion. . . .
It was intensely peaceful. . . . At the moment of being thrown out of the car, I felt no pain. Later there was a lot of pain, 9 on a scale of 0 to 10.

Upon impacting the surface of the ocean at "75 to 80 miles per hour," the Marine pilot whose parachute failed to open suffered two badly shattered ankles, one broken in three places, the other in five, with bone shards protruding though the flesh. Both legs were broken and his pelvis was split. One lung collapsed and three fillings were knocked out of his molars. Later, amputation of both legs was seriously considered. Despite these injuries, he "never felt pain. . . . I knew I was injured badly in the water but it didn't hurt." Later he experienced severe pain, 8 on a 0 to 10 scale.

The Acute Dying Experience with Massive Injury and Suicide

Would massive physical trauma more severe than that experienced in The Accident Study override the analgesic and emotional effects of peritraumatic dissociation? Consider the experience of a Vietnam veteran who suffered a MAIS 6 injury resulting from an explosion on the battlefield. I had interviewed him in a previous study. His military medical records documented that he sustained traumatic amputation of the right arm at the humeral joint [shoulder] with transection of the axillary artery and vein and the brachial plexus [severance of all blood and nerve supply to arm.] He also sustained traumatic amputation of both legs. Bilateral perforation of tympanic membranes [eardrums] with hearing loss was also inflicted . . . with open lacerations over trunk, face and left upper extremity. . . . [He arrived at the 12 Evacuation Hospital] in shock with no blood pressure. (Sabom, 1982, p. 73)

This veteran recalled the following dying experience during this virtually unsurvivable injury, parts of which I have published previously (Sabom, 1982, pp. 73, 167–168):

I got hit in the right foot. . . . It was almost like in the movies when everything goes super slow motion. I went floating through the air. I remember that from whatever height I was, I was looking down and seeing the battle going on but yet I was floating and tumbling through the air.

When I came down and hit the ground, I remember sitting up and I looked down and I saw my right arm gone and my right leg gone and my left leg was laying off to the left side. I fell back. I remember that very clearly. I couldn't get back up.
I felt the moistness around my nose and my ears and head and I realized that I was bleeding through the superficial wounds that I had. I laid back and my whole life was just going in front of me like a very fast computer.

I remember that I had always heard and been told that if you die, you really go through three stages before that death sets in. The first one is that you lose your sight, your ability to see. I remember that I couldn't open my eyes anymore and I couldn't see. The second stage was that you would always lose feeling or pressure. You would not feel pain or pressure. I felt no pain. I couldn't feel pressure. The third part is that you would just go into total relaxation and it's over with. Laying there I was thinking about these three things and I realized realistically what I perceived as dying. . . .

. . . I did believe that I really did die because I am laying there on the battlefield and I came out of my body and I perceived me laying on the ground with three limbs gone. I knew it was me. I recognized it was me. . . . It is a good feeling. I was at total peace with myself because I didn't want to come back. It was different . . . I looked like I had three limbs gone and they [the enemy] probably thought I was already dead . . . I didn't feel anything when I looked at me that way. There was no bad feeling about it. . . . There was no sympathy, there was no sorrow.

Absence of pain from battlefield injuries has been reported in previous wars: “As early as 1946, Beecher, after observing that 75% of severely wounded soldiers on the Italian front did not request morphine, speculated that “strong emotions can block pain”’ (van der Kolk, 1994, p. 257). The majority of Israeli soldiers suffering traumatic amputations during the Yom Kippur War “spoke of their initial injury as painless and used neutral terms such as bang, thump, blow etc. to describe their first feeling and often volunteered their surprise that it did not hurt. . . . Furthermore, 24 h later, all were in considerable pain” (Wall, 1979, p. 259). Thus, peritraumatic dissociation-associated analgesia and emotional anesthesia are capable of blocking the effects of massive, life-threatening trauma.

Would the protective effects of peritraumatic dissociation be present in self-inflicted, life-threatening injuries as well? Only 1 percent of suicidal persons jumping from the Golden Gate and San Francisco-Oakland Bay Bridges survive:

The distance at mid-span from rail to water is 250 feet and about 260 feet at low tide and it takes just three to four seconds to travel this distance. The velocity in a free-fall from the Golden Gate Bridge has been calculated to range between 73.6 and 75 miles per hour of impact force in each case. (Rosen, 1975, p. 290)
For 5 of the 6 jumpers from the Golden Gate Bridge whom David Rosen interviewed,

the fall felt like a long time, from "hours" to "an eternity." . . .

The experience of jumping for all six of the survivors was described as tranquil and peaceful and not frightening or terrifying as one might suspect. . . . One survivor said, "It was a good feeling – no screaming. It was the most pleasant feeling I’ve ever had." . . . One subject stated that he experienced "a sense of relief" and "peace" on the way down. . . . Another reported that his descent was "like eternity – beautiful – I enjoyed the sensation." . . . All but two of the survivors blacked out just before hitting the water. (Rosen, 1975, p. 291)

A woman who jumped from the San Francisco-Oakland Bay Bridge suffered a fractured pelvis necessitating bed rest for several months. "When she jumped she thought, ‘This is the end.’ She thought she would die and she did not struggle against it. She felt ‘a tremendous sense of peace.’ . . . She remembers hitting the water, ‘It felt real good . . . I didn’t feel hurt’" (Rosen, 1975, p. 293).

Thus, the "protective cocoon," as Brown-Lohr described it, of peritraumatic dissociation appears to prevent both emotional and physical distress during life-threatening trauma, whether accidental or intentional.

**Discussion**

The ADE is the experiential continuum lasting seconds to minutes beginning with the sudden, clear perception of threat of significant injury and/or death, followed, at times, by physical trauma, physiological derangement, and loss of consciousness. Swiss geologist Albert von St. Gallen Heim studied this experience in the late 19th century. Heim examined experiences of Alpine climbers during life-threatening falls and found

no anxiety, no trace of despair, no pain; but rather calm seriousness, profound acceptance, and a dominant mental quickness and sense of surety. Mental activity became enormous, rising to a hundred-fold velocity or intensity. . . . Time became greatly expanded. (Heim, 1892, trans. in Notes and Kletti, 1972, pp. 46-47)

In reporting his findings, Heim avoided speculative conclusions but offered his report as consolation to the families of mountain climbing
accident victims. In particular, he noted that the faller, on impact, experienced "No pain!... There are easily a hundred such instances that could be cited, all of which prove that in sudden, severe misfortune pain is omitted" (Heim, 1892, trans. in Notes and Kletti, 1972, p. 47).

Psychoanalytic pioneer Oskar Pfister, a colleague of Sigmund Freud, undertook a psychological interpretation of Heim's findings. According to Pfister, Freud believed that

the living organism would be slain by the energy-charged external world were it not equipped with a special protective apparatus [i.e., a stimulus barrier]. We already observe this in the sensory organs, which can admit only very small quantities of stimulation from the external world. External excitation that through its intensity might be able to break through [or invade] the stimulus barrier would be labeled traumatic. . . . [Upon such traumatic] stimulus invasions: "Mental life summons cathetic energy from all sides in order to effect countercathexes in the region of the invasion point; and all other psychic systems, particularly perception and decision making, are caught up in this enterprise. Hallucinatory pleasure production is set over the unpleasure cathexis evoked by the frightful surroundings."

(Pfister, 1930, trans. in Kletti and Noyes, 1981, pp. 13-14 and 16)

Freud maintained that this "protective shield" against traumatic stimuli was "supplied with its own store of energy" and served "an almost more important function for the living organism than reception of stimuli" (Freud, 1961/1920, p. 27). Pfister proposed that the vivid cognitive and emotional experiences experienced by Heim's fallers, which he called shock thoughts, energized the stimulus barrier "to save the individual from excessive emotional shock" (Pfister, 1930, trans. in Kletti and Noyes, 1981, p. 14).

Noyes and Kletti identified these experiences as "depersonalization in the face of life-threatening danger" and concluded, like Pfister, that "interpretation of depersonalization as a defense against the threat of extreme danger or its associated anxiety seems inescapable" (1977, p. 383). Depersonalization is characterized by "a general dulling or numbing of perception" (Noyes and Kletti, 1976b, p. 26). These acute dying experiences, on the other hand, include features of hyperarousal, involving features of "thoughts sharp or vivid," "thoughts speeded," "vision and hearing sharper" and "altered passage of time."

Hyperarousal reflects "an increased alertness toward a threatening environment" (Noyes and Slymen, 1979, p. 318), particularly in
situations where the person "found opportunity for emergency action" (Noyes and Slymen, 1979, pp. 319–320):

Were it not for awkwardness of the terminology they might be referred to as "personalizing" effects for, in contrast to the depersonalization that causes an individual to feel empty and lifeless, these stimulating effects are accompanied by a feeling of intense alertness and vitality. (Noyes and Slymen, 1979, pp. 318–319)

Harvey Irwin further observed that self-identity during these experiences remains lucid and intact. According to Irwin, what is altered is not self-identity itself, but

the individual's association of self identity with their physical body, or more precisely, with current bodily sensations. In a life-threatening situation these sensations commonly would include anxiety symptoms and physical pain. [But during these experiences] the experiencer is seemingly oblivious to such sensations. . . . From this perspective, sense of identity and mental imagery appear to be dissociated from physical sensations and (the physical concomitants of) emotions. (Irwin, 1993, p. 97, italics added)

Greyson (2000), in studying dissociative symptoms in NDEs, found that "perception, cognitive functioning, emotional states, and sense of identity may be partly or completely disconnected from the mainstream of conscious awareness," and concluded that NDEs involve "the psychological mechanism of dissociation as a normal response to intolerable trauma" (2000, p. 463).

Trauma-induced dissociation during the ADE has recently been labeled peritraumatic dissociation (Marmar, Weiss, Schlenger, Fairbank, Jordan, Kulka, and Hough, 1994). Elegant research in the animal laboratory offers valuable insight into the neurochemical underpinnings of this complex adaptive experience.

**The Perceptual-Defensive-Recuperative (PDR) Model of Response to Predators in Animals**

Consider the response in a natural setting of an animal threatened by a predator. "During the perceptual phase. . . . the traumatic stimulus is detected, encoded and put into memory" (Bolles and Fanselow, 1980, p. 291).

Perceived threat triggers two levels of response. Odors of "reptiles which, under natural conditions exert a limited predatory pressure" on mice, for example, are perceived to be minor, first-tier threats and
"only induce fear-associated behavioral responses" without release of endorphins (Dell'Omo and Alleva, 1994, p.125). On the other hand, threats perceived to be life-threatening, such as mammalian odors or calls of night-hunting, aerial predators, elicit a higher, second-tier response in mice associated with "instantaneous and reflexlike" release of endorphins (Nijenjuis, Spinhoven, Vanderlinden and van Dyck, 1998, p. 70; see also Hendrie, 1991; Rogers and Hendrie, 1984). Endorphins, in turn, suppress panic and fear (Nijenjuis, Spinhoven, Vanderlinden, and van Dyck, 1998; Siegfried, Frischknech, Nunes de Souza, 1990; van der Kolk, 1994), suppress panic-induced escape behaviors (Kalin, 1993), and induce marked analgesia as what Karen Hollis (1982, p. 3) called a "prefigured response" in anticipation of predator-induced, physical injury (Fanselow and Lester, 1988, p. 204).

If predator attack occurs, the defensive phase begins during which the mouse "freezes, or engages in threat displays, or fights back, or runs away, or some way" attempts to survive (Bolles and Fanselow, 1980, p. 292). Wounds "do not produce pain" (p. 292) since "the primary function of the endorphin analgesic system is to inhibit the pain that would otherwise occur" to allow the mouse to focus on survival strategies (p. 297). If survival efforts fail, endorphin-induced analgesia may ultimately ease the pain of death.

A striking example of these endorphin effects along with its "psychic numbing" (Bandura, Cioffi, Taylor, and Brouillard, 1988; van der Kolk and Saprotta, 1991) in a predator-prey interaction, with man being the prey, was reported by David Livingstone who was attacked by a lion in Africa.

Starting and looking half round, I saw the lion just in the act of springing upon me. I was upon a little height; he caught my shoulder as he sprang, and we both came to the ground below together. Growling horribly close to my ear, he shook me as a terrier does a rat. The shock produced a stupor similar to that which seems to be felt by a mouse after the first shake of a cat. It caused a sort of dreaminess, in which there was no sense of pain nor feeling of terror, though quite conscious of all that was happening. . . . This singular condition was not the result of any mental process. The shake annihilated fear, and allowed no sense of horror in looking round at the beast. The peculiar state is probably produced in all animals killed by the carnivora; and, if so, is a merciful provision by our benevolent Creator for lessening the pain of death. (Livingstone, 1874, p. 49)

If the mouse survives and danger and fear pass, it enters the recuperation stage during which "there may be pain resulting from
tissue damage suffered in the attack. It is at this stage that the animal rests, inhibits unnecessary activity, and perhaps engages in more specific recuperative behaviors such as licking its wounds" (Bolles and Fanselow, 1980, p. 292).

Thus, the PDR model predicts a three-stage response to life-threatening danger: a perceptual stage during which predator threat is perceived and its attack anticipated with a first- or second-tier response, a defensive stage during which endorphin-mediated survival strategies are employed, and a recuperation stage during which the injured prey experiences pain and attends to its wounds. Recuperation may not be necessary, of course, if the prey escapes without injury or dies under endorphin analgesia.

The PDR Response to Threat in Humans

Humans encountering life-threatening trauma experience a sequence of events remarkably similar to that observed in the threatened animal.

Phase One: Perceptual. Perception of threat is the key traumatic stimulus in humans. Recognizing this, the American Psychiatric Association changed its definition of a potentially traumatizing event from one "outside the range of usual human experience" (American Psychiatric Association, 1987, p. 250) to the "personal experience [i.e., perception] of an event that involves actual or threatened death or serious injury" (American Psychiatric Association, 1994, p. 424; emphasis added).

As in animals, perceived severity of threat determines level of response in humans. Heim (1892) noted in survivors of mountain climbing accidents that

the same person who is able to achieve remarkable acts of this sort [that is, self-rescue] in the face of death will be completely paralyzed by dread in less dangerous situations. He is no longer able to act so remarkably and is even likely to act in the reverse manner. We conclude that presence of mind arises in response to the highest degree of surprise; in response to a lower degree many persons are, instead, paralyzed. (Heim, 1892, trans. in Notes and Kletti, 1972, p. 47)

Pfister concurred with Heim's observation of a two-tiered human response to different levels of threat:

One would first expect that the reaction to shock would be paralysis of thought and affect. But this happens only where the danger is not
maximal. Where there is a mild or strong, but not a greatest possible fright, there are degrees of paralysis and speechlessness. But recognition of mortal danger triggers an immense rise in thought production. The rise serves the stimulus barrier in two ways. First, it revises reality and instills a feeling that the danger can be coped with. As a rule this problem is so well resolved that Heim found no evidence of anxiety or pain in 95% of all climbers who had fallen . . . . Secondly, shock thoughts separate one from reality . . . . Derealization is like the feeling of being a mere spectator. . . . (Pfister, 1930, trans. in Kletti and Noyes, 1981, p. 14)

In The Accident Study, perceived severity of threat was sufficient to trigger this second-tier response of peritraumatic dissociation with endorphin release in 83 percent of cases. Depth of peritraumatic dissociation response as measured by PDEQ-SR scores was associated with participants' perceived certainty of death.

Clarity of threat perception is also important. Following onset of a cardiac arrest in the supine individual, consciousness and electroencephalographic activity persist for 9 to 21 seconds (Aminoff, Scheinman, Griffin, and Herre, 1988; Clute and Levy, 1990; de Vries, Bakker, Visser, Diephuis, and Huffelen, 1998). During this brief conscious interval, terror and pain—not peritraumatic dissociation, peace, and painlessness as found in The Accident Study—are encountered (Dlin, Stern, and Poliakoff, 1974; Dunbar, Warner, and Purcell, 1993; Kowey, 1988; Sabom, 1982, 1988). Perception of life threat in the arrest situation, however, appears ambiguous or absent, even after resuscitation has begun. As one man described it during his cardiac arrest:

I heard the crash cart call for our room and I heard myself saying, "Somebody's made a mistake. This can't be." . . . The other guy and I checked the leads to make sure they were still hooked up. And they were. I said, "Well, I wonder why they got this room?" (Sabom, 1998, p. 58)

As resuscitation procedures began, he emphatically protested: "Wait a minute. I want to explain something to you. I don't think you got the right guy" (Sabom, 1998, p. 59).

Another man described a nearly identical scenario:

I hear another Code Blue go off. I am lying there thinking, Who's next?

Suddenly I see these people running into my cubicle. I'm saying, "Not me! Not me!" Obviously they can't hear a thing, but my mind is working. There is all sorts of calamity going on and I'm telling them, "Leave me alone! Leave me alone!" I thought they should be looking after somebody else. (Sabom, 1998, p. 56)
Thus, clear perception of sudden, life-endangering threat in The Accident Study triggered a peritraumatic dissociation response; whereas ambiguous perception of sudden, life-endangering threat from cardiac arrest is not usually associated with a dissociative experience.

The source of the threat, that is, external in accidents and internal in arrests, and its resulting survival benefit may also make a difference. When the threat is external, peritraumatic dissociation and hyperarousal may aid self-rescue, leading to an adaptive response with positive survival benefit. When the threat is internal, the threat is not clearly perceived nor is self-rescue possible. Moreover, if hyperarousal in the setting of a cardiac arrest were to occur it could actually aggravate the offending arrhythmia and be detrimental to survival (Sabom, 1998, p. 57). The factors responsible for this difference in the ADE of accident and cardiac arrest victims deserve further study.


As shown in Table 2, depth of peritraumatic dissociation correlated positively with markers of perceived threat to life as indicated by subjective rating of certainty of death, and of physical threat to life as indicated by severity of injury, loss of consciousness, and hospital treatment. Feelings varying from absence of emotion to profound peace predominated during these traumatic events.

Noyes and Kletti reported that this “almost universal response to life-threatening danger” occurred “instantly upon the recognition of danger” (1977, pp. 381–382). In The Accident Study, two participants experienced peritraumatic dissociation in less than a second. A man with a PDEQ-SR score of 2.3 ran into the back of a large truck with his motor scooter: “I said ‘Oh, crap’ and then it was over.” Another man scoring 1.9 on PDEQ-SR was the front-seat passenger in a car hit by a garbage truck going 70 miles per hour: “It seemed like forever but it had to have been less than a second.” Moreover, Noyes and Kletti reported a mountain climber who “noted that although his fall of 30 feet had not taken long, he found ‘ample time in a peculiarly calm
and impersonal way’ to think that he would probably die. ‘It is
difficult,’ he commented, ‘to describe the odd third-person viewpoint I
seemed to have during the fall’” (1976a, p. 24).

Noyes also reported that many of his survivors of life-threatening
circumstances “described themselves as functioning effectively under
extraordinary circumstances, aided by a sense of calm objectivity”
(1979, pp. 78–79). For the Marine pilot in The Accident Study whose
parachute failed to open, momentary panic suddenly ended “as if I had
had a shot of something to calm me down.” Following this, he “never
had any more panic,” a state of mind that allowed him to rescue
himself from a very difficult and complicated life-threatening situation
in a matter of seconds. Heim likewise noted calm presence of mind in
mountain climbers during the initial portion of their falls:

Paralyzing anxiety was absent, ideational activity seemed enormous-
ly increased, and time seemed drawn out. Judgment remained clear
and objective, and as far as external circumstances permitted, the
faller remained capable of lightning-quick action. (Heim, 1892, trans.
in Notes and Kletti, 1972, p. 47)

Symptoms of hyperarousal – including “thoughts sharp or vivid,”
“thoughts speeded,” and “vision and hearing sharper” – had a high
positive correlation, while the symptom of “thoughts blurred or dull”
had a high negative correlation, with the overall ADE (Noyes and
Slymen, 1979). Speeding of thought coupled with slowing of time was
frequently found in The Accident Study to facilitate survival in
emergency situations, as noted above. In some cases, however, these
symptoms could be detrimental to survival. Douglas Carson studied
this phenomenon in military pilots required to make precisely timed
maneuvers in life-threatening situations:

When an individual experiences a temporal distortion, time expands
and events appear to happen in slow motion. . . . It seems that the
brain instantly becomes intensely alert, increases its efficiency, and
begins to process information at an accelerated rate. . . .

These temporal distortions, like spatial disorientations, are
particularly dangerous because they are insidious. We tend to believe
our perceptions. Our brains, like computers, take in information,
process it, and make a decision. That decision is translated into a
course of action. If some of the information is erroneous, the decision
could be a bad one, and the resulting course of action, particularly in
the case of an aviator, may be a fatal one. (1982, pp. 10, 27)

In The Accident Study, one man felt that acceleration of thought and
distortion of time were partly to blame for his motor vehicle accident:
During the whole episode, time seemed to slow down. I can't tell the difference between time slowing down and my thoughts speeding up. One of the problems was that I was trying to turn the wheel too much in my effort to gain control. I think that was one of the reasons I put the rear wheel in the ditch. I overcorrected. It took a long time before the car was responding, so I just kept turning the wheel. I'm sure the time distortion had something to do with me turning the wheel too much.

Survival is also enhanced during a second-tier threat response by an outpouring of endorphins and other, non-opioid substances (Hohmann, Suplita, Bolton, Neely, Fegley, Mangieri, Krey, Walker, Holmes, Crystal, Duranti, Tontini, Mor, Tarzia, and Piomelli, 2005; Yamada and Nabeshima, 1995) that induce analgesia equivalent to 8 milligrams of morphine sulfate, the maximal recommended dose for the severe pain of myocardial infarction (van der Kolk, Greenberg, Orr, and Pitman, 1989).

Dissociation in and of itself may also induce analgesia. Ketamine, a non-opioid anesthetic, works by causing dissociation, which in turn provides analgesia “roughly double that provided by morphine.” Ketamine “produces a trancelike state” that in many ways resembles that found during the ADE:

This state results from an electrophysiologic dissociation between the limbic and higher cortical systems and is termed dissociative anesthesia. Patients sedated with ketamine appear to be awake and have little higher cortical depression. At the same time, however, cortical awareness is blocked from external stimuli, including auditory, visual, or pain-related input. As in a dreamlike state, awareness of time during ketamine sedation is also blunted. Brainstem activity remains normal, and processes for maintaining essential cardiac and respiratory functions are unaltered. (Li, 2005, “Ketamine: Emergency applications,” at http://www.emedicine.com/emerg/topic802.htm, accessed 04/17/07)

As in predator-prey interaction, analgesia occurs when “treatment of the injury does not have the highest biological priority.... The three obvious high priority behaviours are fighting, escaping and obtaining aid” (Wall, 1979, p. 260).

In The Accident Study, physical pain was completely absent in 84 percent of injured participants and muted in the remainder. This effect occurred at all levels of injury. For example, the Marine pilot whose parachute failed to open sustained multiple severe injuries upon impact with the ocean. Top priority at that moment was obtaining aid and staying afloat. Consequently, “until the time they picked me up, I never felt pain.” Following a bad knee injury in a
motor vehicle accident, a man painlessly fled the scene of the accident to obtain aid:

I tore up my right knee and cut my forehead and my nose and landed outside the car. I tore the anterior ligament of my knee. . . . Afterwards, I was scrambling up the embankment for 5 minutes or so because my knee was not stable and I kept falling back down. Within a few minutes, the ambulance was there. I experienced no pain at the time of the accident, but 4 hours later it began to hurt. Prior to that, the knee felt funny and wasn’t supportive. But it didn’t hurt.

Hitting one’s thumb with a hammer is quite a different experience, however. Here pain is instant and severe:

In what way does this injury differ from a painless injury? My interpretation is that the only possible relevant biological action is to nurse and treat the injured tissue. This action takes precedence over all other possible actions in the victim’s repertoire. The victim fully understands and controls the causes of his injury. There is no escape needed, there are no known unexpected dangers and repetition will not occur. Attention and behaviour are now completely monopolized by caring for the injury [that is, recuperation]. . . . (Wall, 1979, p. 260)

As survival strategies fail and death appears imminent, peritraumatic dissociation “may serve as a means of psychological escape when physical escape is not possible” (Gershuny, Cloitre, and Otto, 2003, p. 164). “At the point of surrender, fear subsides and a feeling of tranquility, often profound, develops. With the end of uncertainty, anxiety falls away and the event of death itself is faced with calm” (Noyes, 1972, p.178).

These final feelings were experienced by Brown-Lohr when she realized “this is how I’m going to die” and then encountered “the most incredibly peaceful moment I’ve ever known, that I was in no pain. I had no fear anymore, it was total peace” (Survival in the Sky, 1996; emphasis added). And when a drowning woman in The Accident Study realized “there is nothing I can do, just give up,” she experienced no pain and an “extraordinary feeling of total peace. I have never experienced that before – extreme peacefulness. It was just this overwhelming feeling.”

Following this profound feeling of peace during the acute dying experience, the person may experience a transcendental or mystical experience, that is, an NDE. The point at which the acute dying experience transitions into an NDE is difficult to pinpoint since their symptoms overlap within a rapidly-developing, continuous experience. Heim noted in his sample of mountain climbers that early in a fall
dissociation and hyperarousal characteristic of the acute dying experience occurred. Later in the fall, when death appeared certain, the faller “often heard beautiful music and fell in a superbly blue heaven containing roseate cloudlets” (Heim, 1892, trans. in Notes and Kletti, 1972, p. 470). According to Noyes and Slymen, this transcendental phase seemed to involve exclusion of the surrounding environment from awareness. Intense visual imagery appeared in its place giving rise to hallucinatory phenomena in some instances. The more frequent appearance of most of these effects, when death seemed imminent, suggests that a mystical state of consciousness represents a more complete withdrawal from extreme circumstances. (1979, p. 315)

This mystical extension of the ADE is associated with extreme peace and painlessness. I did not encounter it in The Accident Study but I have found it in more severe, life-endangering accidents and cardiac arrests (Sabom, 1982, 1998). This comports with Noyes and Kletti’s observation “that the mystical extension of this experience occurred almost exclusively in persons in whom some alteration in cerebral functioning might be presumed to have occurred” (1976a, p. 25).

Phase 3: Recuperative. During recuperation following injury, humans like animals are “best served by pain-motivated behaviors and the inhibition of other behaviors” (Bolles and Fanselow, 1980, p. 292). “Nociception subsequently evokes recuperative behavior” (Nijenhuis, Vanderlinden, and Spinhoff, 1998, p. 247). Pain is felt for the first time. This response is nicely illustrated in The Accident Study, in which 87 percent experienced pain for the first time not during the injury itself but only later during recuperation.

In The Accident Study, participants expressed surprise at their lack of fear and pain during their traumatic encounter. After rolling his car, a man recalled: “Fear didn’t really set in until the next day when I realized after seeing the car what I had really experienced. Wow, that was a scary moment!” Following a serious auto accident, another man commented: “I was not at all afraid at that time. I had no discomfort. I was just observing it . . . . Later, when it was over, I took a hard look at it and realized what had just happened and that I had not been horrified.” Still another man reflected following a head-on collision: “After it was over and after I got all the boys out of the car and made sure everybody was OK, then it dawned on me that ‘Hey, these people could have been really hurt.’”
According to John Gibbs, experiencing "surprise, shock, or puzzle-
ment" following a traumatic experience such as those described "may
mean the discovery of profound knowledge about the self or reality"
important not only for "individual human cognitive development but
also for the collective development of science" (1997, p. 273). Fear and
horror are commonly expected during a life-threatening situation but,
like pain, they are held off by the adaptive mechanism operative in the
ADE. Surprise at this unexpected result leads to questioning
preconceived notions of what dying may be like.

Survivors following a major train disaster reported similar behav-
ioral responses. "The reaction of most individuals immediately after
the crash was one of numbness, unreality and of almost detached
calm. . . . Panic was notable by its infrequency" (Boman, 1979, p. 463).
Minutes to hours later, "the survivors' mental state changed. They
often cried uncontrollably, felt extremely fearful, and found the horror
of what they had been through and their narrow escape from death
beginning to dawn on them" (Bowman, 1979, p. 464).

The overwhelming emotion and pain often experienced after the
threat has passed marks the end of the ADE and the beginning of the
recuperative process. Dissociative and hyperarousal aspects of the
ADE, however, may carry over into, or become manifestations of, an
acute stress disorder during the first month following the trauma, or
posttraumatic stress disorder months to years later. These psychiatric
disorders contain symptoms - no longer adaptive, but now pathologic -
of both dissociation, such as "a subjective sense of numbing, detach-
ment, or absence of emotional responsiveness," "derealization," "deper-
sonalization," and "dissociative amnesia" (American Psychiatric Asso-
ciation, 2000, p. 471), and hyperarousal, such as "difficulty sleeping,
irritability, hypervigilence, exaggerated startle response" (American
Psychiatric Association, 2000, p. 472; Marmar, Weiss, Schlenger,
Fairbank, Jordan, Kulka, and Hough, 1994; R. Noyes, personal
communication, February 8, 2007). Further discussion of these delayed
psychiatric symptoms lies outside the scope of this essay.

Summary and Conclusion

This essay defines the ADE and its subjective psychological and
physical manifestations. These occurred instantaneously upon the
sudden, clear perception of threat of significant injury and/or death
and were followed, at times, by physical trauma, physiological
derangement, and loss of consciousness. Peritraumatic dissociation, measured by the PDEQ-SR, deepened with increasing levels of perceived threat and physical injury. Hyperarousal — for example, speeding thought, narrowing and sharpening perception, and preparation for action — facilitated self-rescue. A feeling of calm and peace held potentially paralyzing emotions in abeyance. Physical analgesia, induced by endorphins and dissociation in and of itself, occurred even with massive trauma and allowed for the implementation of defensive and rescue strategies. A mystical or transcendental experience, that is, an NDE, may follow the acute dying experience in severely injured persons on the boundary of death. Once danger passed, the first-time appearance of overwhelming emotion and pain often marked the end of the ADE and the beginning of recuperation.

The ADE mirrors the three-stage response of perception, defense, and recuperation observed during predator-prey interaction in animals. It appears to be an adaptive response promoting survival in the acute situation. However, symptoms of the ADE may in some individuals be carried over into, or become manifestations of, delayed psychiatric disorders.

Considered together, these findings present an interesting paradox: the more terrifying and traumatic an accident may appear, the more peaceful and painless the accident may be experienced. More than 100 years ago, Heim observed:

Quite certainly it is incomparably more painful in both the feeling of the moment and subsequent recollection to see another person fall than to fall oneself. This is attested to by innumerable narratives. Often the spectator, incapacitated by paralyzing horror and quaking in body and soul, carries away from the experience a lasting trauma, while the person whose fall was watched . . . comes away from his experience free of fright and pain. (Heim, 1892, trans. in Notes and Kletti, 1972, p. 51)

Modern-day survivors of acute, life-threatening accidents continue to be surprised at the painlessness, peace, slowing of time, and disconnection from the body experienced at the height of the trauma. One survivor concluded: “One of the things that I learned from it was that time, and all of life, lives in how we perceive it. It may not be as solid as we think.” This study has shown that the experience of dying a sudden, traumatic death does not reflect the horror of the scene or extent of physical injury, but is mercifully transformed in the eye of the beholder into a tranquil and painless event.
References


Embellishment of Near-Death Experiences

To the Editor:

In reading the Summer 2007 issue of the Journal of Near-Death Studies, I was especially taken with Keith Augustine's comments about embellishment of near-death experience (NDE) accounts (Augustine, 2007). He asked the same questions many of us in research do: Are narratives ever exaggerated, changed over time, or colored by the experiencer for any reason?

Bruce Greyson (2007) found no significant difference with 72 experiencers who recently filled out an extensive survey report that they had previously done 20 years ago. His conclusion after comparing the two: "Memories of near-death experiences appear to be more stable than memories of other traumatic events" (Greyson, 2007, p. 410). In other words, there were no significant differences in the accounts as a result of time's passing.

This agrees with what I have noticed in my research of near-death states, for the most part. Still, there are other reactions and responses experiencers exhibit that cause me to be careful in how I regard near-death accounts initially. A rendering of what I have found follows.

No Initial Disclosure

After having interviewed nearly 4,000 adult and child experiencers, I can state that it is typical for near-death experiencers to withhold an initial reporting of what happened to them. Many are afraid to be so open, either because they fear being labeled crazy and made to face a psychiatrist, or because they are unsure how others might respond, so they keep it secret. Most, though, are so overwhelmed by what happened that they simply "do not have words" and struggle silently with the issue of belief: Can they trust what they experienced? Was it really, really real? Are they kidding themselves? How can it best be described? What can they make of it?
Testing Period

A common reaction of experiencers once they decide to tell someone is to test first for trustworthiness. And they will do that in dribs and drabs by tossing out a morsel or two — words, phrases, maybe a drawing or a poem — that indicate something uniquely different happened during the time they nearly died or actually flatlined. This "dribbling" can be frustrating to families, friends, and researchers, stretching interview sessions overlong, or causing others to lose patience and maybe become suspicious about the sincerity of the experiencer. Lengthy testing periods, extending over months on end or even for years, can create tension between people and lead others to write off the NDEr. Most people in the research community understand how to handle the issue of trust, but not all of them. I know this because of comments I received from experiencers, especially those who had distressing, unpleasant, or hellish experiences. It helped me in my work that I, too, was an experiencer. Seldom did I admit this; really I did not have to. Experiencers "just knew."

The Narrative

Once they start talking (either right away or later on), it may be a challenge to stop near-death experiencers. I call this outpouring "gushing." Even while still on the operating table, experiencers once revived can engage in a nonstop flood of words describing what they saw on "the other side," what they heard, what they felt, what was revealed to them. This can cause problems with the medical staff and any family members who might be waiting for word of outcome. That initial "gush" is usually spontaneous, spirited, sometimes loud and animated, with splashes of colorful descriptions and great emotion. If more time has passed, narratives tend to be more thorough, specific, detailed, and deeper. The experiencer, by then, may have already begun the process of searching for meaning and trying to interpret the scenario. Gaps and additions, which may appear as if they were narrative alterations or embellishments, can and do occur between early and later tellings. Rarely is this a lie or an exaggeration. Rather, what I recognize as happening here is that experiencers are giving themselves permission to tell their story in its entirety. That takes courage. To tell someone everything that occurred exposes the individual in ways that may be uncomfortable and a violation of privacy. There are two big issues at this juncture: first, trusting one's
own self-belief; and second, weighing and balancing elements in a narration that are frankly no one else's business or are too bizarre for words. I have observed that once the various trust and privacy issues are settled (even if only within "self" and never admitted to anyone else), the end result, the individual's near-death story, will remain intact over time and not be changed to any significant or noticeable degree. That is what Greyson verified in his study.

**Media Matters**

The greatest tempter for embellishments is the prospect of writing a bestselling book and/or becoming a stage presence, whether in churches or in front of television cameras. And I have seen this happen again and again. Part of the problem is the media's demand for sensationalism: publishers cannot sell near-death books unless the newest one tops the others; television shows must jerk or shock or grab every five minutes or viewers get bored; audiences hunger for emotional release and have little patience for someone who simply "tells it like it is." The media provide an incredibly amazing source of vital information, news, education, and entertainment, but they also grind out copy and swallow the truth in an orgy of commercial demands that can defy reason. Near-death experiencers can get lost in this terrain and wind up saying or doing things they did not intend. This type of environment influences regular society as well, and some near-death experiencers are too protective of the copyright to their stories, to the point of withholding necessary information for research.

**"Downloading"**

So what constitutes embellishment and how do we recognize it? To answer that question fairly we need to admit "downloading" occurs. Oftentimes during the experience, but especially afterwards, it is commonplace for a near-death experiencer to suddenly be "seized" with additional information, guidance, revelations, messages, knowings, wisdoms, feelings, vivid images, and thoughts not their own. This "extra" material can expand as years pass. Typical responses from people who experienced "downloading" are: "I felt as if I would burst if it didn't stop"; "There's so much to know that it comes in segments, pieces, so I can handle it"; "The revelations are unending, they just keep coming"; and "I feel as if I'm being fed from above, stuffed full of knowledge and insight."
I have yet to find that this additional downloading of extra material changes the original scenario. The near-death experience that occurred remains the near-death experience that was reported. Once the individual accepts what happened and arrives at some sense of meaning as to the various issues and implications involved for him or her personally, the narration tends to take on a structure that holds lifelong. This does not preclude the downloading process, nor remembering more later, especially if the individual is a child expercerer.

The Conundrum of the Child Experiencer

In my research with children who had experienced a near-death experience, more than half regretted that it ever happened to them, once they were older. They explained that the incident complicated their life in ways that made growing up a challenge. The majority spoke of being put down or ridiculed by parents, siblings, and friends when they tried to share their story, to the point that they “set it aside” or “tucked it away.” Because of this, many did not really deal with their experience or try to integrate it to any extent until they were in their 20s or 30s, some even later. Memory, then, tended to surface in tiers: what could be useful in childhood, what applied to relationships as they grew, what made a difference as an adult, and what spoke to their heart of hearts in quiet moments of reflection and longing. About a third of the child experiencers in my research were clear about what they experienced and immediately appeared wiser than their years, more mature. The other two-thirds delved into the depths of their memories in steps, especially if their episode happened during birth trauma. Once what was tucked away “burst forth,” they appeared to me as if awakened to a truth they had always known but had somehow forgotten.

This delay in remembering, whether it came in steps or in a sudden “burst,” can seem like an embellishment to someone not familiar with the near-death phenomenon and what is typical of experiencers. This fact concerns me, since some professionals jump to conclusions or do incomplete research. For example, a recent paper published in *New England Journal of Medicine* about electrical stimulation of the brain that induced the appearance of a person outside the body named this illusion an “out-of-body experience,” when all the scientists did was induce autoscopy or the *doppelganger* effect of projecting one’s image beyond one’s body, which is a feature of shamanistic training
worldwide and has been for thousands of years (De Ridder, Van Laere, Dupont, Menovsky, and Van de Heyning, 2007;357). Out-of-body experiences and autoscopy are not the same thing.

So we come back to the original question. What I have observed in my work is that the original story once told as believed by the experiencer holds over time, along with an array of additions and insights that reflect the integration process. These "extras," for the vast majority, are neither exaggeration nor imaginative invention or embellishments. They are simply an attempt at clarification, as much for the experiencer's benefit as for the others they inform.

References

P. M. H. Atwater, L.H.D.
e-mail: atwater@cinemind.com

Study of Perception in Autoscopic NDEs

To the Editor:

In "Does Paranormal Perception Occur in Near-Death Experiences?" Defended," Keith Augustine charged that in a study I reported in my book *Recollections of Death* (1982), "Sabom did not use the proper control group" (Augustine, 2007, p. 268). This study was designed to address the question: Did "thirty-two people (reporting an autoscopic NDE) have sufficient knowledge of the resuscitation procedure prior to their NDE to construct a plausible approximation of their near-death crisis even without having observed it from their purported out-of-body location?" (Sabom, 1982, p. 83, italics added). Here is the description of that study:

Twenty-five "control" patients were interviewed whose backgrounds were similar to those reporting autoscopic NDEs ... and who had been
consecutively admitted to a coronary care unit (CCU). These twenty-five controls were seasoned cardiac patients with an average duration of known heart disease exceeding five years, including prior cardiac-related hospitalization for a heart attack (20 patients), heart catheterization (12 patients), open-heart surgery (8 patients), elective cardioversion (2 patients), cardiac arrest without an NDE (4 patients) and cardiac pacemaker implantation (1 patient). While in the CCU, each of the patients had had the opportunity to observe closely at his bedside a cardiac monitor to which he was attached, a cardiac defibrillator, and intravenous needles and equipment. Moreover, each patient had admitted to regular viewing of a home television set prior to this admission. Thus this group of twenty-five cardiac patients had received considerable exposure to hospital routine and television programs, both of which could have contributed to their knowledge of CPR.

During the interview, each patient was asked to imagine that he was standing in the corner of a hospital room watching a medical team revive a person whose heart had stopped beating. He was then asked to describe in visual detail what he would expect to see in such a situation. He was cautioned to describe only those details that he was reasonably confident would actually be seen during CPR on a hospitalized patient. Each of these interviews were tape-recorded and later analyzed.

Twenty-three of the twenty-five interviewed patients made some attempt to describe the CPR procedure based on their own general knowledge of hospital equipment and protocol. Without undue prompting, twenty of these twenty-three respondents made a major error in their descriptive accounts. The most common error was the belief that mouth-to-mouth breathing would be the routine method of artificial ventilation in the cardiac-arrested, hospitalized patient. In truth, mouth-to-mouth breathing is a rarely used means to oxygenate a patient during in-hospital CPR because of the rapid availability of alternate, more efficient methods of artificial respiration. . . .

Additional errors in these descriptive accounts included misconceptions (by separate patients) of the oral airway used to ensure an open air passage during CPR ("They would use wooden throat paddles, like an ice cream stick, only bigger"); misconceptions of cardiac massage ("a blow to the back to start the heart beating again," "opening up the chest to place the hands around the heart and massage it," "a hard blow to the solar plexus to get the heart started again," "the doctor doing the pushing on the chest would straddle the patient over his thigh region and push up"); misconceptions of cardiac defibrillation ("electric shock would be given through those wires which are fastened onto the chest and hooked up to the cardiac monitor," "the electric shock would be given through a needle stuck in the heart through the chest"); and misconceptions about the defibrillator paddles used to deliver the electrical energy to the chest ("they would be hooked up to an air tank and pressurized," "they would have a suction cup on the bottom of them," or "they would not be hooked up to anything").

Three of the twenty-five patients gave limited descriptions of CPR procedure which were without obvious error. One patient was able to
describe the cardiac defibrillator present in his room at the time of the interview ("that machine over there") but had no concept of the technique of external cardiac massage, artificial ventilation, or other CPR procedures. Another patient had watched his father's resuscitation in a hospital emergency room and recalled the following scene: a "doctor pushing down on his [father's] chest, center of the chest, with one hand on top of another and sweat pouring off" and "something going in his [father's] arm, with a nurse holding up some sort of liquid in a bottle." The third patient had watched his roommate being resuscitated in the surgical intensive care unit during a previous hospital admission: "the doctor was pressing down on the chest, one hand over another" and the defibrillator was "a big square machine with two pad-looking things with wires on them." This last patient was unable to describe how those "two pad-looking things" would be used on the patient and did not comment on artificial ventilation or use of needles or injections. ... [T]wo claimed no knowledge of CPR technique whatsoever. (Sabom, 1982, pp. 84–86)

Since the in-hospital experience of patients in the control group was similar to that of autoscopic NDErs prior to their NDE, this study correctly offered "some insight into what an 'educated guess' would be" (Sabom, 1982, p. 86) of CPR procedures by the NDErs prior to their NDE.

Augustine (2007b, p. 268) claimed "that corroboration for the specific details unique to the NDErs' own resuscitation was lacking in Sabom's study" (2007b, p. 268), based upon the following quote from Michael Potts:

Without the details of the resuscitation in the medical records, which often leave out the specific details of procedures used, there is no accurate way to check a patient's account to determine whether it is accurate ... If there were cases of NDEs in which patients recalled visual information that could only been learned by actually being outside the body, such as recalling specific details of the clothing worn by the code team, specific details of the resuscitation including the order of events, or details of the room in which the resuscitation occurred that could have only been learned by actually being there, then this would support the out-of-body interpretation of NDEs. ... but such evidence is lacking at present. (Potts, 2002, pp. 250–251)

Augustine then added: "If there were evidence of the sort Potts outlined, then the data would contradict my critique of near-death veridicality studies; but, as Potts also noted, anything of the sort has yet to happen" (2007b, p. 269).

In a lengthy section of Recollections of Death entitled "Autoscopic Descriptions with Specific Details" (Sabom, 1982, pp. 87–115), I
presented interviews with six NDErs who recalled specific visual details of their near-death crisis events, including the placement of an oxygen mask, chest thump, external cardiac massage, insertion of an oral airway, lubrication of defibrillator paddles, placement of defibrillator paddles, charging of the defibrillator machine, movement of hospital personnel away from the bed, movement of the dials on the defibrillator machine while being charged, body response to defibrillation, injection of intracardiac medications, checking for pupillary response, palpation for carotid pulse, insertion of a subclavian vein catheter, and drawing of arterial blood gases from both the femoral and radial artery.

When these NDE reports were compared to the medical record (which specifically documented many of these details), to third party testimony, and to advanced cardiac life support protocol, the content and sequence of CPR details were found to be extremely accurate and case-specific. In addition, one patient identified during an autoscopic NDE the unexpected arrival of three family members at a distant hospital location during his cardiac arrest. The accuracy of this man's report was later confirmed in separate interviews with family members (Sabom, 1982, pp. 111-113). None of the errors made by control group patients were reported by NDErs. A traditional explanation for the accuracy of these NDE accounts was sought but not found (Sabom, 1982, pp. 113-115, 151-178).

If the autoscopic NDE is a true "eyewitness" account, then an analogy can be drawn between an eyewitness to a crime and an NDEr's visualization of CPR. In both situations, the person is afforded a brief glimpse of an unexpected and unfamiliar scene under stressful circumstances which frequently involves a "weapon" (a gun or knife in the case of a crime; a threatening instrument or procedure in the case of CPR).

Crime research has shown that witness confidence in the report correlates positively with the accuracy of recalled details (Bothwell, Deffenbacher, and Brigham, 1987). In my study, high confidence (for example, "it was realer than real," "clearer than normal vision," "this is no figment of my imagination") correlated positively with high accuracy of autoscopic NDE reports, compared to "reasonably confident" control group reporting, which correlated positively with inaccurate reports.

Crime research has also found that witness identification of the perpetrator of a crime in a lineup falls from 56 percent to 35 percent when a weapon is present. The weapon itself is accurately identified
91 percent of the time. This variance is due to a “weapon focus” phenomenon, with the weapon acting as a “salient-object attention distracter” (Kramer, Buckhout and Eugenio, 1990). In my study, details recalled in an autoscopic NDE were heavily weighted, as in crime scene reports, toward “salient object attention distracters,” and in both situations such “attention distracters” were accurately described. Thus, the nature and content of NDE autoscopic accounts resemble those of true eyewitness reports.

Taken together, these results support the patient’s claim that nonordinary perception of real events (that is, an autoscopic NDE) had indeed occurred.

References


Michael B. Sabom, M.D.
100 Wing Mill Road
Atlanta, GA 30350
e-mail: MSabom@aol.com

Four Errors Commonly Made by Professional Debunkers

To the Editor:

In an editorial previously published in this Journal (Grossman, 2002), I coined the term “fundamaterialist” to characterize a person whose attitude towards materialism is the same as the fundamentalist’s attitude towards his or her religion. In each case, the attitude is
one of unwavering certainty towards the chosen ideology. For fundamaterialists, materialism does not appear to be an empirical hypothesis about the real world; it appears to be a given, an article of faith, the central tenet of his web of belief, around which everything else must conform. As all philosophers know, it is always logically possible to hold onto any a priori belief, no matter what the evidence to the contrary, by making enough ad hoc assumptions; so I am not at all surprised that Keith Augustine, in his recent articles in this Journal (2007a, 2007b, 2007c) was able to sustain his faith in materialist ideology even in the face of near-death experiences (NDEs). This letter will not be a response to anything Augustine wrote, but rather is directed more to the scientists who might be “taken in” by some of the fallacious reasoning that he and other debunkers customarily employ. I will discuss four such fallacies, three briefly, the other at greater length.

Augustine committed the first fallacy in his very first sentence, when he claimed that “a survivalist interpretation of the phenomena ... is severely undermined by the overwhelming evidence for the dependence of consciousness on the brain” (Augustine, 2007, p. 3). But that is nonsense. William James (1898) showed, more than a hundred years ago, that (1) the most that the facts of neurology can establish is a correlation between mental states and brain states and (2) correlation is not causation. The data of neuroscience will always be neutral with respect to the hypotheses of (1) causation or materialism and (2) what James called “transmission,” the hypothesis that the brain merely transmits an already existing consciousness into the particular form that is us. Neuroscience cannot in principle distinguish between these two hypotheses.

A second kind of error that Augustine and his fellow materialist ideologues frequently commit is to believe that a hypothesis of the form “some As are Bs” is refuted by producing many As that are not Bs. Survival researchers have amassed considerable empirical evidence to suggest that the hypothesis “Some NDEs involve veridical perception” is true. Augustine’s counterargument appeared to consist of little more than producing examples of NDEs with nonveridical perception. But the fact that some NDEs have hallucinatory features does not argue against the hypothesis that other NDEs do involve veridical perceptions. If the survivalists’ hypothesis were that all NDEs involve veridical perception, then Augustine would have had a point, and his examples would have falsified that hypothesis. But, as
all philosophers know, the word “some” has very different logical properties than the word “all.”

The third fallacy involves a deep confusion between the concept of evidence and the concept of proof. Science deals with evidence, not proof. The concept of proof, of “proving” something with 100 percent certainty, is a concept of mathematics and logic, and has no place in empirical science. The evidence that researchers have amassed over the years for the hypothesis that consciousness is independent of the body is very strong and very compelling (Kelly, Kelly, Crabtree, Gauld, Grosso, and Greyson, 2006). When debunkers argue that such accumulated evidence is not proof, they believe they have said something important, something that allows them to continue to believe rationally in their materialist ideology. But this is a totally trivial point that everyone grants from the outset. Science is not in the business of supplying “proofs”; it is in the business of supplying empirical evidence, and the evidence it has already supplied for the hypothesis that consciousness is independent of the brain is very strong indeed. The demand for “proof” in matters empirical is logically impossible; hence scientists ought not to succumb to the fundamaterialists demand that “proof” be forthcoming.

Our legal system recognizes two different standards of evidence: “beyond a reasonable doubt” for criminal cases, and a “preponderance of evidence” or “more likely than not” for civil cases. The proper standard for empirical science is closer to the civil standard than to the criminal standard. No empirical scientific hypothesis is ever established with 100 percent certainty, and it is always reasonable to doubt any empirically established hypothesis or theory. Science deals with empirical truths, not logical truths. A standard trick of debunkers is to hold survival research to the criminal standard of evidence, while the rest of science does quite well adhering to the civil standard. Often the researchers themselves fall for this trick: Janice Holden, in her excellent response to Augustine, felt obliged to write almost apologetically that “Belief in life after death must ... remain to some degree a matter of inference” (2007, pp. 34–35). But all of science is a matter of inference, and an empirically based belief in survival is every bit as “scientific” as any other belief inferred from empirical evidence.

The fourth kind of logical fallacy, which I will go into in greater length, involves an equivocation between two very different meanings of the word “possible.” I recently asked students in my graduate seminar to say what we mean when we call a theory or hypothesis
possible. A philosophy graduate student answered that to say that a hypothesis is possible means that it is consistent, that it can be formulated without self-contradiction. This is the correct conception of logical possibility: a hypothesis is said to be logically possible if it is not self-contradictory. But a psychology graduate student offered a different conception of possibility. She suggested that a hypothesis is possible only if there is some empirical reason to believe that it might be true. Let us call this conception of possibility empirical possibility. The difference between these two meanings of the word “possible” is enormous, and I will argue that an equivocation between the two meanings allows debunkers to believe they actually have a rational perspective; it is also a main reason that the so-called “superpsi” hypothesis was ever taken seriously. But first I will give some examples to illustrate the two very different meanings of the word “possible.”

Consider the following hypothesis: an advanced civilization exists on Mars and is living beneath the surface of that planet. Is this hypothesis possible? The hypothesis is not self-contradictory, so it is logically possible. But there is absolutely no evidence that suggests that the hypothesis might be true. So it is not possible in the sense that there are any reasons to believe it might possibly be true. The “hypothesis” is simply a sentence that is not self-contradictory. Is it possible that UFOs will land on the White House lawn tomorrow? Again, that proposition is not self-contradictory, so it is logically possible. But there is no evidence to believe that that hypothesis might be true; that is, it is not a real possibility.

Contrast this purely logical usage of the word “possible” with the following: the weatherman states that it is possible that it will rain tomorrow. In this context, the weatherman is not merely informing us that the sentence “it will rain tomorrow” is not self-contradictory. The weatherman is making an empirical statement about the real world. He is stating that present atmospheric conditions are such that, in X percent of past such situations, it rained the next day. Hence the possibility, or probability, of rain tomorrow is X percent. Notice that even if X is very small, say 5 or 10 percent, the hypothesis is still empirically grounded. So when the weatherman talks about the possibility of rain, he is talking about a possibility that is real, and not a mere logical possibility; that is, he is not talking about a possibility that is merely imagined, and for which there is no empirical evidence whatsoever.
So there is a big difference between a hypothesis that is merely logically possible (that is, a hypothesis that is not self-contradictory) and a hypothesis that is really possible (that is, a hypothesis for which there are empirical reasons to believe might be true). Of course, any real possibility must also be a logical possibility, but the converse is not true. The fact that a given hypothesis is logically possible, that is, is not self-contradictory, is not a reason to believe that it is a real possibility, that is, that it might be true.

Science is concerned with real possibilities only, not with mere logical possibilities, that is, not with hypotheses whose sole virtue is that they can be stated without self-contradiction. Philosophers, on the other hand, do consider what I have called mere logical possibilities, and such consideration is an indispensable and important aspect of a philosopher’s training. One such logical possibility, which would be familiar to anyone who has taken an undergraduate philosophy course, is the “evil genius” argument of Descartes. Is it possible, asked Descartes, that a mischievous deity is causing us to have the sense perceptions that we do have, while at the same time there is no external world, and so our belief in an external world is false? Or equivalently, as students today pose the problem, is it possible that we are living in the “Matrix”? This is of course a logical possibility, but it is not a real possibility unless empirical reasons are forthcoming.

Hume’s famous problem of induction invoked the logical possibility that the laws of nature would not continue to operate in the future. It is possible, wrote Hume, that the laws of nature as we know them will cease to operate tomorrow. But this means nothing more than that the sentence “the laws of nature will cease to function tomorrow” is not self-contradictory. And the mere fact the sentence is not self-contradictory is not a reason to believe it might actually be true. This is how we get tricked into taking seriously the debunkers’ various claims that “it could be this,” or “it could be that.” This is to treat a mere logical possibility as if it were a real possibility. It is as if we treated Descartes’ “evil genius” argument as a real possibility, and felt we could not assert the reality of an external world until we had “proved” that we were not being systematically deceived. Philosophers love to worry over arguments like this, but they have nothing to do with science, which considers real, that is, empirical possibilities only. No one would ever think of applying for grant money to investigate whether or not we are living in the Matrix. No one would think of
applying for funding to investigate the hypothesis that the laws of nature might stop working tomorrow.

I wish to mention briefly two historical examples, one famous and the other not, that involve this confusion between logical possibility and real possibility. As is well known, Creationists, when confronted with the data such as fossils that show that the Earth is much older than a literal reading of the Bible would indicate, claim that when God created the world 5700 years ago, he created it with the fossils as we find them. What are we going to believe, asks the Creationist: the testimony of our senses or holy scripture? They then challenge the Evolutionists to "prove" that God did not thus create the world. Is this a challenge that any scientist, or any rational person, ought to accept? The hypothesis "God created the world 5700 years ago with the fossils as we find them" is of course logically possible. But no one reading this seriously believes that evolutionary theory is on less solid ground simply because this logical possibility cannot be refuted. And likewise, I doubt that anyone reading this seriously believes that the independence of consciousness from the brain is on less solid empirical ground simply because the logical possibility of fraud can never be refuted. Neither the Creationists' hypothesis nor the debunkers' various hypotheses represent real empirical possibilities; they were proposed for the sole purpose of ignoring data that contradicted their a priori worldview.

Here is another example that is just as silly, but because its silliness was expressed in sophisticated philosophical jargon, it actually got published in the respectable journal Philosophy. Philosopher Robert Almeder (2001), after examining several of the stronger reincarnation-type cases collected by Ian Stevenson, which include verified memories, skills and behaviors appropriate to the purported past-life personality, birth marks, and so on, concluded that it is irrational not to believe in reincarnation, given the data. But philosopher Steven Hales (2001) argued that it could be the case that these children with verified past-life memories were really abducted by aliens. These aliens, for their own amusement, planted false memories into the brains of the children, so that they would come to believe they had been somebody else. Presumably, the mothers of these children would also have been abducted while pregnant, so that the birthmarks could be planted on the fetus.

This, claimed Hale, would explain everything that needed to be explained, and had the virtue of being consistent with materialism. The aliens, after all, are physical beings, so that there is no need to posit the
existence of disembodied consciousness, which very idea was repugnant to Hales, to account for cases of the reincarnation type. The burden of proof was cleverly shifted to the believers in reincarnation first to "prove" that the children had not been abducted by aliens before they can rationally assert the truth of the reincarnation hypothesis.

But this is just sophisticated nonsense that should not be, and should never have been, taken seriously. The alien abduction hypothesis is of course logically possible, but calling it "logically possible" means merely that the sentence "aliens abducted the children and planted memories in their brains" is not self-contradictory. But that is not a reason for serious scientists trying to understand real-life phenomena to take it seriously. Scientists are obligated to investigate real possibilities, not imaginary ones. A logical possibility is imaginary only; that is, anything that a human being can consistently imagine is a logical possibility. The alien abduction hypothesis would move from the realm of the purely imaginary to the realm of the real only if there were some evidence to suggest it might be true. What might count as evidence? If the children were found to have implants in their skulls, or if the children were able to remember being abducted, then the abduction hypothesis would represent a real possibility. But no such data are forthcoming.

Notice, incidentally, that neither Hales nor any other fundamaterialist tries to deduce any observational consequences from their imaginary hypotheses, as I have just done. They are content to merely imagine that everything can be explained away in terms consistent with their materialist ideology; they have absolutely no interest in investigating whether what they are imagining is true. That would take them out of their armchair imaginings and into the real world; and real-world data have refuted materialism over and over again. Hales's concern, like that of the religious fundamentalists, is ideological, not empirical. He wants real scientists, who are trying to account for real data, to take as a real possibility what he himself takes as only a logical possibility, or in other words, merely imagines. The debunker wants us to refute mere logical possibilities before we can legitimately make the inference from the data to survival.

And if the fundamaterialist says that the hypothesis of an afterlife is so extraordinary that we should prefer any other hypothesis, so long that it is consistent with materialism and not self-contradictory, my reply is as follows: There is absolutely nothing extraordinary about the hypothesis of an afterlife. The overwhelming majority of people in the
world believe it, and have always believed it. I grant, however, that there exists a rather peculiar subgroup of human beings for whom the survival hypothesis is extraordinary. This subgroup consists of people who have been university-educated into accepting materialist dogma on faith. We have been brainwashed by our university education into accepting that the hypothesis of an afterlife is extraordinary. It is perhaps time to acknowledge this, and to acknowledge that we are all suffering from what Gary Schwartz has called “post-educational stress disorder” (Schwartz and Simon, 2002, p. 224). Part of this “disorder” is that we have internalized the academy’s materialist worldview, and we call anything that falls outside that worldview “extraordinary.” But it is the materialists’ worldview that is truly extraordinary, especially when one considers the ridiculous hypotheses that that worldview advances in order to save itself, such as “superpsi,” alien abduction of children who appear to remember past lives, and nonfunctioning brains still somehow producing conscious experience.

Survival researchers are under no obligation to refute every, or even any, logically possible alternative hypothesis. Such “hypotheses” are nothing more than the imaginings of the fundamaterialists; the burden is on them to provide non-ideological empirical support for their hypotheses before scientists should take them seriously. In the absence of empirical support, such hypotheses merely reflect the fantasy life of the debunkers, and science is not obliged to take unsupported imaginings and fantasies seriously. However, Augustine and the debunkers can rest comfortably, knowing that logic guarantees that they will always be able to believe in materialism, come what may. But we should not pretend that the debunkers and fundamaterialists are concerned with empirical science, and hence journals such as this should not allot so much space to mere ideology.

References

Augustine Responds

To the Editor:

Having presented a comprehensive three-part critique of survivalist interpretations of near-death experiences (NDEs) and defended it against multiple commentators, I am generally inclined to allow readers of this Journal to reflect upon the entire exchange and take from it what they will without offering further comment. However, I feel compelled to point out a number of fallacies that Neal Grossman commits when, ironically, accusing me of fallacious reasoning. Although Grossman prefaces his letter with the disclaimer that it “will not be a response to anything [I] wrote,” he explicitly implicates me along with “other debunkers” in customarily employing fallacious reasoning, and in any case there is no point in him bringing up errors “that Augustine and his fellow materialist ideologues frequently commit” if he does not mean to imply that my critique contains them.

Neal Grossman, Ph.D.
Department of Philosophy (MC267)
1421 University Hall
University of Illinois at Chicago
601 South Morgan Street
Chicago, IL 60607-7114
e-mail: Nealg@uic.edu

Augustine Responds
Right from the start, Grossman stereotypes those skeptical of survivalist interpretations of NDEs as ideologues plagued by “unwavering certainty” in a materialist faith. But his comments reveal his own “unwavering certainty” that NDEs and other phenomena represent a smoking-gun falsification of materialism. One wonders if any evidence could ever persuade Grossman of the truth of strict materialism or a related view, such as David Chalmers’s property dualism, in which mental states are nonphysical properties of the physical brain and thus irreducible to brain states, but existentially dependent upon the properly functioning brain in which they inhere (Chalmers, 1996).

Indeed, one wonders if Grossman thinks that it is possible for anyone to hold a materialist or similar position rationally on the basis of the empirical evidence. His comments strongly insinuate that anyone who does not accept the reality of mind-brain separation — a class including the vast majority of cognitive scientists and philosophers of mind, I might add — is simply burying his or her head in the sand. And yet, contrary to what Grossman would have us believe, the evidence for survival of bodily death does not even approach that of an established scientific fact like plate tectonics or global warming. Consequently, Grossman seems to possess the very ideological traits which he attributes so disparagingly to those he disagrees with.

Since Grossman does not engage any of the specific arguments or evidence that I offered, it seems that he does not take issue with how I arrived at my conclusions, but with what conclusions I arrived at. If Grossman thinks that the data favoring survival are compelling, why does he not simply cite them, as Michael Sabom does in his excellent preceding letter? In lieu of letting the data speak for themselves, Grossman opts to attack ideas that he happens to find disagreeable. But his personal proclivities, like my own or those of anyone else, are irrelevant. His comments seem to betray an ideological commitment to a robust dualism, as he does not intend to respond to anything that I actually wrote, but simply to his stereotype of “the fallacious reasoning that [I] and other debunkers customarily employ” lest serious researchers be “taken in” by my sophistry. It is as if he feels compelled to offer a defense of the faith to protect “naïve” researchers from straying from the flock. Having already persuaded Raymond Moody (2007), Allan Kellehear (2007), and Mark Fox (2007) that I have some valuable insights to contribute, I am a dangerous heretic indeed.

Just what evidence, in principle, could falsify Grossman’s dualistic commitments? Since he characterizes my brief reference to an
LETTERS TO THE EDITOR

argument against personal survival from the concomitant variation of mental states and brain states as a nonsensical fallacy decisively refuted by William James over a century ago, evidently no scientific findings could ever shake Grossman's dualistic faith. In fact, James's response to the strong neurophysiological evidence against personal survival is just one of about a dozen such responses, some of which overlap, and some of which are mutually exclusive (Braude, 1993; Broad, 1925; Hart, 1959; Hasker, 1983; Hasker, 1999; James, 1989; Kelly, Kelly, Crabtree, Gauld, Grosso, and Greyson, 2006; McTaggart, 1906; Murphy, 1945; Popper and Eccles, 1984; Stokes, 1993; Swinburne, 1997). It seems that Grossman commits yet another fallacy in presuming that producing an answer to a problem is equivalent to producing an adequate answer.

I cannot develop the various lines of evidence supporting the neurophysiological argument here, but in essence it maintains that the mind-brain correlations that we actually find, such as the dramatic effects of brain damage on mental functioning, are extremely unlikely to obtain if the mind can exist independently of the brain. Bertrand Russell succinctly captured its force: “The argument is only one of probability, but it is as strong as those upon which most scientific conclusions are based” (Russell, 1957, p. 51). Similarly, Paul Edwards noted that “We have just as strong evidence for concluding that certain brain states bring about certain conscious states as we have for any number of causal relations between purely physical phenomena which are not questioned” (Edwards, 1992, p. 294). One would hope that the fact that prominent parapsychologists like C. D. Broad, Gardner Murphy, Douglas Stokes, and John Beloff have conceded the strength of this evidence would have given Grossman some pause in being so dismissive of its implications (Beloff, 1997; Broad, 1925; Murphy, 1945; Stokes, 1993).

Instead, Grossman claims that the neuroscientific data “will always be neutral with respect to the hypotheses” that the brain produces consciousness, or merely “transmits” it. But is he talking about one of those mere logical possibilities which he later derides, such as the possibility that we are all living in the Matrix, or is he talking about what he characterizes as a real scientific possibility? Ironically, he writes of young-Earth creationism that “no one reading this seriously believes that evolutionary theory is on less solid ground simply because this logical possibility cannot be refuted.” I might add that no one reading this should seriously believe that the dependence of
consciousness on the brain for its existence is on less solid ground simply because the mere logical possibility of "transmission" cannot be refuted – if it cannot be refuted.

On that note, how does Grossman know that, in principle, no evidence could ever favor the productive hypothesis over the transmissive one? In fact, we already have such evidence: the generation of two centers of consciousness after severing the corpus callosum connecting the two cerebral hemispheres. William Hasker, in developing his own idiosyncratic defense of dualistic survival, writes of such evidence:

Even more telling are the split-brain data. Eccles admits that in split-brain cases "there is remarkable evidence in favour of a limited self-consciousness of the right hemisphere" (Evolution of the Brain: Creation of the Self [London: Routledge, 1989], p. 210). This is especially significant coming from Eccles, who is essentially a Cartesian dualist: it is hardly intelligible that a Cartesian consciousness should be divided by an operation on the brain, so Eccles's admission has to reflect strong empirical pressure from the experimental data. (Hasker, 1999, p. 193n42)

Of course, no matter what neurophysiological evidence is forthcoming, Grossman can always use the escape clause that the brain filters some pure "already existing consciousness into the particular form that is us." But that comment inadvertently concedes the argument, for when we talk about survival after death, we are not talking about the persistence of some abstract Aristotelian active intellect or universal cosmic mind, but personal survival, the "human personality and its survival of bodily death." Given the extent of known correlations between mind and brain, any immaterial mental thing that might be temporarily intertwined with an organic brain is going to be radically diminished, not enhanced, once the "filter" of the brain is destroyed – so much so that any "unfiltered" mind that comes out on "the other side," stripped of all its "memories, feelings, behavioral dispositions, and other personality traits" (Stokes, 1993, p. 76), would not be the person we knew in life. And as Stokes explicitly noted, all of the various sources of so-called survival evidence, including out-of-body experiences (OBEs) and NDEs, actually conflict with the transmissive hypothesis, as they suggest that whatever survives death retains such individualistic traits (Stokes, 1993).

In his first paragraph, Grossman engages in an informal fallacy known as "poisoning the well," conveying that readers can simply
ignore any arguments or evidence I offered because I am pushing some agenda. But however readers judge whether I have some agenda to push, such judgments are irrelevant to whether my arguments succeed, whether my data are accurate, and whether my conclusions are reasonable extrapolations from the data. To maintain otherwise is like contending that because Grossman is in the middle class, his students can safely dismiss any arguments he makes that the richest 1 percent of Americans should pay higher taxes than they currently do. This poisons the well by suggesting that his argumentation is motivated by promoting his own personal benefit. The implication here is that readers of this Journal can safely ignore my arguments and evidence, bypassing the need to refute any of the arguments or evidence I offer. This sort of tactic is designed to close dialogue before it can even get off the ground. Since Augustine is an ideological "debunker," survivalists need not take anything he has to say seriously.

Next Grossman claims that I fallaciously argued that the existence of hallucinatory NDEs constituted sufficient evidence to refute the proposition "Some NDEs involve veridical [paranormal] perception." It is puzzling that Grossman thinks that I argued such, given that the first of my three articles (Augustine, 2007a) focused solely on claims of veridical paranormal perception in NDEs. If I had thought that the existence of NDEs containing false perceptions of the physical world were sufficient to refute such claims, I would not have bothered to address them independently of my presentation of NDEs with hallucinatory features (Augustine, 2007c). What I did argue was that "NDEs with overt hallucinatory features do give us some grounds to suspect that NDEs that are not so explicitly hallucinatory are hallucinations as well" (Augustine, 2007d, p. 60), and I supported that by analogy to the hypothetical discovery of discrepant alien abduction experiences.

In fact, apart from the evidence for the dependence of consciousness on the brain, it is the combination of merely ambiguous evidence for paranormal perception during NDEs and clear instances of NDEs with hallucinatory features that provides the strongest grounds for understanding NDEs as hallucinations. And readers can rest assured that I addressed what near-death researchers themselves have proposed as the best anecdotal cases of paranormal perception in NDEs by noting that my first article (Augustine, 2007a) considered three out of four of the examples of veridical NDEs highlighted in the
“Key Facts about Near-Death Experiences” brochure available on the
International Association for Near-Death Studies (IANDS) website
(www.iands.org).

I will largely ignore Grossman’s implication that I conflate strong
scientific evidence with mathematical or logical proof, as that straw
man is nowhere to be found in my critique. It is nonetheless notable
that he points out that “The demand for ‘proof’ in matters empirical is
logically impossible” in this sense of “proof” – as if this comment was
not, in his words, “a totally trivial point that everyone grants from the
outset.”

His statement that the evidence for the independence of mind from
body is “very strong and very compelling” is more of a statement of
opinion than of fact. He certainly cannot appeal to any sort of scientific
consensus that there is “very strong and very compelling” evidence for
the independence of consciousness from the brain, as he could if he
were talking about natural selection or a heliocentric model of the
solar system. And however strong Grossman takes the evidence for
mind-brain independence to be, it pales in comparison to the
neurophysiological evidence that having a properly functioning brain
is a necessary condition for having a human mind. That, not some
“fundamaterialist” ideology, is why almost all contemporary neuro-
scientists hold that “consciousness is inseparable from the functioning
of individual brains” (Beyerstein, 1991, p. 44). His appeal to a
preponderance of the evidence also overstates his case, since if
anything a preponderance of the total available evidence strongly
points to the dependence of consciousness on the brain, and at best it is
an open question whether a preponderance of the so-called survival
evidence alone really is best explained on the survival hypothesis.
Moreover, the amount and quality of the data supporting the
dependence of consciousness on the brain is far greater than that
supporting the survival hypothesis.

In another straw man fallacy, Grossman implies that I equivocate
between the logical possibility of a proposition and its “empirical
possibility,” which Grossman characterizes as having empirical
evidence that the proposition is true. “Science is concerned with real
possibilities only,” we are told, begging the question that my critique
does not concern any “real” possibilities. If I had not already
disavowed any taste for the superpsi hypothesis, Grossman could be
forgiven for illustratively mentioning it. Falsifiable psi hypotheses
appealing to living persons’ limited paranormal powers in lieu of
survival might not qualify as "real possibilities" either, given no compelling evidence that such powers exist, let alone play a role in OBEs and NDEs. But I explicitly disavowed appealing to any paranormal processes (Augustine, 2007b), since explaining a known phenomenon like NDEs in terms of an unknown contrivance is no explanation at all. It is also telling that I disavowed exotic possibilities like bilocation precisely because they do not amount to "real possibilities" in Grossman's sense (Augustine, 2007d), and yet Grossman surmises that there are "merely imagined" possibilities in my critique without acknowledging those to be found in some of the responses of the commentators.

Based on my imagined confusion, I supposedly delude myself into thinking that I hold a rational point of view. But ignoring Grossman's condescension, from Pam Reynolds's actual description of her NDE to a comprehensive survey of the features of extant non-Western NDE reports, my critique avoided discussion of "a possibility that is merely imagined, and for which there is no empirical evidence whatsoever" whenever there was relevant empirical evidence available. What more could Grossman hope for? Some discussions were necessarily speculative given the paucity of the relevant evidence, but my critique was certainly no more speculative than other, more survival-friendly papers that have been published in this Journal. And despite Grossman's hasty and demonstrably false generalization that skeptics never attempt "to deduce observational consequences" of the theories they propose, I went out of my way to point out how several of my suggestions could be empirically tested or falsified through future research to preempt such unwarranted criticism.

But this is no matter to Grossman, who apparently finds no value in my skeptical critique at all. In his mind, anything I might say can be automatically disqualified from consideration, as anything I say must be "proposed for the sole purpose of ignoring data that [contradict my] a priori worldview" so long as I do not come around to his purportedly a posteriori worldview. It does not even matter that Grossman offers no evidence for such a bald and sweeping assertion. Given this, I have no expectation that anything I might say here will cause him to budge an inch. But I do hope that by taking the time to respond, I will persuade others not to follow his lead. Such ideological tribalism does not serve anyone's interests, and it is a senseless obstacle to determining the truth of the matter concerning NDEs. If we take Grossman's accusations seriously, those who endorse the reality of the
paranormal or survival are simply following the evidence where it leads, whereas it is impossible to reject the paranormal or survival without being an ideologue. And yet in the face of ambiguous evidence, who but an ideologue would make such a claim?

If the truth is on his side, Grossman has nothing to fear from skeptical critiques such as mine. Indeed, if he is right, by presenting a strong but fair critical appraisal of survivalist interpretations of NDEs, I have done survivalists an enormous favor, providing them with a means to tighten up their arguments in favor of such an interpretation. How much stronger would a case for a survivalist interpretation be if it took critiques like mine seriously and responded to them, rather than blithely dismissing them? In the end, as it has been with every scientific advancement in human history, it will be the data that will decide which of us is correct – or more likely, which aspects of both of our respective positions are prescient and which are false.

References


Keith Augustine, M.A.
Internet Infidels
PO Box 142
Colorado Springs, CO 80901-0142
e-mail: kaugust@infidels.org
THE ESSENTIAL TOOL FOR NDE RESEARCHERS

* Interactive CD-ROM for PC and Mac
* Searchable database of over 800 articles on NDEs—all scholarly articles and most non-scholarly articles published through 2001
* Includes abstracts for most scholarly articles
* Indexed by 135 NDE-related topics, such as:
  - Accounts of NDEs—autobiographical
  - Characteristics of NDEs—out-of-body
  - Definition of NDEs
  - Famous People's NDEs
  - Media Treatment of NDEs
* Enables you to create a customized list of citations for ordering reprints—either from your own source or from the Near-Death Literature Clearinghouse (order form included in CD).

Price of CD:

**Individuals**

**First Time Order**

$85 for IANDS Professional Members and JNDS subscribers

$95 for all others

**Upgrade** (for those who purchased NDE Research Bibliography Part I; mail jewel box insert from first CD with payment)

$35 for IANDS Professional Members and JNDS subscribers

$45 for all others

**Institutions**

$200

To purchase with major credit card, go to:

www.iands.org → shopping cart → publications

To purchase with check, money order, or major credit card:

IANDS

P.O. Box 502

East Windsor Hill, CT 06028-0502

860-882-1211

More information at www.iands.org → Resources → NDE Index
INSTRUCTIONS TO AUTHORS

JOURNAL OF NEAR-DEATH STUDIES encourages submission of articles in the following categories: research reports; theoretical or conceptual statements; papers expressing a particular scientific, philosophic, religious, or historical perspective on the study of near-death experiences; cross-cultural studies; individual case histories with instructive unusual features; and personal accounts of near-death experiences or related phenomena.

GENERAL REQUIREMENTS: Logical organization is essential. While headings help to structure the content, titles and headings within the manuscript should be as short as possible. Do not use the generic masculine pronoun or other sexist terminology.

MANUSCRIPTS may be submitted in electronic format (preferred) or hard copy. Electronic manuscripts may be submitted by e-mail to the Editor, Bruce Greyson, at cbg4d@virginia.edu, or by mailing a computer diskette or CD-ROM to the Editor at the address below. Please clearly designate the name of the file containing the manuscript and the hardware and software used. IBM-compatible files are preferred in WordPerfect, but other programs for IBM-compatible or Macintosh computers are acceptable. Manuscripts submitted as hard copy should be submitted typed on one side of the page only, double spaced throughout, with a margin of at least one inch on all four sides, and all pages should be numbered. There are no absolute limits on length of articles, but authors should strive for conciseness.

Send manuscripts and/or computer diskettes or CD-ROMs to: Bruce Greyson, M.D., Division of Perceptual Studies, University of Virginia Health System, P.O. Box 800152, Charlottesville, VA 22908-0152, USA.

TITLE PAGE should contain the names of the authors, as well as their academic degrees, institutional affiliations, titles, and telephone number, fax number, and e-mail address for the senior author. Include a name, postal address, and e-mail address for reprint requests.

ABSTRACTS: Abstracts of 100–200 words are required with all articles. Abstracts should include the major premises of the article, intent, hypotheses, research design, results, and conclusions. For research reports, include the purpose, hypotheses, method, major results, and conclusions. For review or discussion articles, identify the main themes and conclusions and reflect them in a balanced fashion; if sources are important (for example, previous research), include these. For other types of articles, including replies to other authors’ articles or case histories, refer briefly to the main themes and conclusions and cross-reference if necessary. Abstracts should be nonevaluative in tone, and should include as much information as possible within the constraints of space.

KEY WORDS: Articles should include two to five key words, listed after the abstract, which will be printed in the Journal and used by abstracting services for indexing the article. This is unnecessary for book reviews and letters to the editor.

FOOTNOTES AND ENDNOTES are strongly discouraged.

REFERENCES should be listed in alphabetical order (and chronologically for each author) at the end of the article, and referred to in the text by author(s) and year of publication. Only items cited in the text should be listed as references. Personal communications and Internet websites may be cited in the text, but should not be included in the list of references. Include all authors in references with multiple authors. Do not abbreviate journal titles. Capitalize principal words in journal titles, but only the first word in a book title or subtitle. Page numbers must be provided for direct quotations.

ILLUSTRATIONS should be self-explanatory and used sparingly. Tables and figures must be in camera-ready condition and include captions. Electronic artwork submitted on disk should be in TIFF, EPS, or PDF format (1200 dpi for line and 300 dpi for halftones and grayscale art). Color art should be in the CMYK color space. Artwork should be on a separate disk from the text, and hard copy must accompany the disk.