

Guest editorial

What is post-traumatic stress disorder?

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Abstract

Although post-traumatic stress disorder (PTSD) and traumatic brain injury (TBI) are categorized as separate and discrete disorders, the boundary between them is sometimes indistinct. Their separation is based on the assumption that PTSD results primarily from psychological stress, while TBI is the consequence of an identifiable injury to the brain. This distinction is based on an antiquated polarity between mind and brain, and the separation of the two disorders often becomes arbitrary in day-to-day psychiatric practice and research.

This issue of *Dialogues in Clinical Neuroscience* is titled “Trauma, Brain Injury, and Post-traumatic Stress Disorder.” The articles between its covers address both post-traumatic stress disorder (PTSD) and traumatic brain injury (TBI). As the combination of these articles indicates, the various recent wars in the Middle East have awakened an old controversy about the relative impact of physical and psychological stress in causing neuropsychiatric disorders. Although the term TBI suggests the occurrence of some type of physical lesion, while PTSD suggests a disorder occurring as a consequence of psychological stress, the boundary between the two is often unclear and sometimes permeable or overlapping.

The first systematic discussion of the relationship between physical and psychological stress dates back to World War I. The history of that discussion provides an informative context for current controversies concerning PTSD and TBI.¹ Combat techniques in World War I introduced new types of combat stress that had not existed during previous wars. Soldiers engaged in trench warfare were relatively immobile and therefore more vulnerable. They were

also chronically exposed to new and perversely lethal threats, such as poison gas, machine gun fire, mortar attacks, land mines, and tanks. Casualties were devastating, and fatality rates were frightening. Men watched their friends die beside them, and they confronted the possibility of their own demise on a daily basis. Alternatively they might be maimed and consigned to a life of chronic disability. As the war progressed, the high casualty rate made it clear that Britain and continental European countries were losing many of an entire generation of young men—a social loss from which they would be slow to recover. This sense of futility and despair was eloquently expressed by British war poets such as Wilfred Owen and Siegfried Sassoon:

*Earth's wheels run oiled with blood. Forget we that.
Let us lie down and dig ourselves in thought.
Beauty is yours and you have mastery,
Wisdom is mine, and I have mystery.
We two will stay behind and keep our troth.
Let us forego men's minds that are brute's natures,
Let us not sup the blood which some say nurtures,
Be we not swift with swiftness of the tigress.
Let us break ranks from those who trek from progress.
Miss we the march of this retreating world
Into old citadels that are not walled.
Let us lie out and hold the open truth.
Then when their blood hath clogged the chariot wheels
We will go up and wash them from deep wells.
What though we sink from men as pitchers falling
Many shall raise us up to be their filling
Even from wells we sunk too deep for war
Even as one who bled where no wounds were.*

Wilfred Owen

Strange Meeting

Project Gutenberg Etext of Poems by Wilfred Owen

In this context of brutal bloodshed and omnipresent fear, a new and somewhat unfamiliar type of disability emerged that had not been described in previous wars: a syndrome characterized by confusion, memory impairment, headache, difficulty concen-

Guest editorial

trating, tremor, and sensitivity to loud noises. This was initially assumed to be due to exposure to explosions, leading to concussions of the brain (“commotion cerebri”) in the absence of visible signs of external head trauma, and the disorder began to be referred to as “shell shock.” Postmortem examination of two cases revealed a variety of abnormalities, particularly vascular damage and congestion.² As the war progressed, the number of shell shock casualties grew alarmingly.

By mid-war, however, it was observed that some soldiers presenting with the symptoms of shell shock did not have any evidence of exposure to explosions. This puzzling paradox—a concussion-like syndrome in the absence of documentable head trauma—challenged the explanatory powers of contemporary medicine, particularly in an era when no tools were available to explore the living brain non-invasively. Ultimately this paradox led to the introduction of a distinction between a neurasthenic/emotional/“nervous” condition and a more physically based one caused by a specific explosion exposure. During subsequent years multiple scholarly attempts were made to determine whether these two conditions represented discrete disorders or syndromes and whether clear boundaries could be set to distinguish between them.³⁻⁶

This debate was paralleled by the rise of two competing traditions within neuropsychiatry: biological vs psychodynamic explanations for the development of disorders. Within the biological tradition one important perspective (particularly relevant to the etiological debate and remarkably prescient of future developments) was presented by Selye, who coined the term “stress” and hypothesized that it was mediated by the hypothalamic-pituitary-adrenal (HPA) axis.⁷ He described the General Adaptation Syndrome as a response to stress and considered the traumatic neuroses to be a consequence of chronic or severe stress. Walter Cannon also proposed a related physiological basis for fear responses in his description of the “fight or flight” syndrome.⁸ A second important perspective was provided by the psychodynamic tradition, which

developed an extensive explanatory system that could account for the role of psychological factors in producing symptoms and in developing both healthy and unhealthy coping mechanisms.⁹

This debate, and the perspectives provided by the competing traditions, had a significant impact on policy decisions. This distinction was invoked in making decisions about the grounds for determining disability both during and after combat, and it was also significant for determining criteria for awarding pensions.^{6,10,11} Veterans from World War I were eligible for pensions as a consequence of suffering from shell shock, but concerns were raised about the large number of recipients and the possibility of malingering. As World War II loomed in the future and then occurred, British policy created strict criteria for recognizing and awarding disabilities secondary to shell shock/stress/neurasthenia—all in the direction of minimizing or eliminating any rewards for disabilities considered to be psychogenic.¹⁰

After the end of World War II, American psychiatry decided to create a standard nomenclature that would be used by all psychiatrists; the impetus came initially from the Veterans’ Administration and was influenced by the World War II experience, which required that psychiatrists from across the United States and from diverse training backgrounds develop a common language for discussing psychopathology, making diagnoses, and determining disability. This led to the formulation of a diagnostic category called Gross Stress Reaction, which appeared in the first *Diagnostic and Statistical Manual (DSM-I)*, published in 1952. Its description emphasized that the disorder was a reaction to a great or unusual stressor that invoked overwhelming fear in a normal personality. It emphasized that the disorder was transient and reversible; if the symptoms persisted, another diagnosis was to be given. Thus the definition was more influenced by the psychodynamic traditions that prevailed at the time than by biological models, and it did not lend itself to making frequent diagnoses of service-connected disabilities in the post-World War II era.

Guest editorial

Thereafter the diagnosis went into oblivion. Since it was closely linked to the history of warfare, it was completely omitted from *DSM-II*, published in 1968—23 years after the last Great War and during a period of relative peace.

When the *DSM-III* Task Force was assembled in the early 1970s, one of the tasks that it confronted was to decide whether the diagnosis of Gross Stress Reaction should be reinstated in the *DSM* nosological system. The Vietnam War was winding down and had been very unpopular. Unfortunately, the general public was not able to distinguish between the war and the people that our country had drafted to fight in it, and so Vietnam veterans quite understandably felt defensive, undervalued, and angry. A small but militant subgroup of Vietnam veterans clamored for the introduction of a diagnosis that would recognize the potential consequences of experiencing the stress of combat, and that might perhaps provide disability and treatment benefits for the psychiatric disorder that combat stress induced. Bob Spitzer, the Task Force chair, asked me to deal with the problem; he knew that I was hard-working and intellectually agile; but he did not know that I was actually already an expert on the topic of stress-induced neuropsychiatric disorders. I began my psychiatry career by studying the physical and mental consequences of one of the most horrible stresses that human beings can experience: suffering severe burn injuries. Within this model of stress, I had already examined brain abnormalities using electroencephalography, the pattern of acute and chronic symptoms, the long-term outcome and its predictors, and the role of coping mechanisms.¹²⁻¹⁶

I was also well aware of the extensive research that had been done to identify symptom patterns that arise as a consequence of exposure to a wide variety of stressors, ranging from natural disasters to death camps to military combat.

The answer to the veterans' request was obvious to me: there is a well-established syndrome, defined by a characteristic set of physiological (autonomic) and cognitive and emotional symptoms, that occurs after exposure to severe physical and emotional stress. In

fact, its scientific basis was as strong as that available for disorders such as depression or even schizophrenia. To call it "post-Vietnam-syndrome" (the name chosen by the veteran advocacy groups) would demean its well-established validity and narrow its range excessively. It would be best to call it "Post-traumatic stress disorder." I wrote the definition of PTSD for *DSM-III* based on my recognition that a variety of stressors can induce a final common pathway that is expressed by a variety of autonomic/physiologic, cognitive, and emotional symptoms that occur in response to a severe stressor. Because I knew from my research with burn patients that individuals with prior disabilities (eg, epilepsy, abuse of alcohol or illegal drugs, depression) were more vulnerable to developing PTSD, I threw out the requirement that the symptoms had to arise in a previously normal individual. This opened the gate a bit, as compared with the definition for Gross Stress Reaction. But I also narrowed the gate by requiring that the stressor—the actual etiological factor—had to be "outside the range of normal human experience" in order to avoid the risk of overdiagnosis.

Once the diagnosis of PTSD became available after the publication of *DSM-III* in 1980, it quickly enjoyed widespread use, often in ways that were not anticipated. The genie was out of the bottle and began to actively intervene in psychiatric practice and research. Although the precipitating stressor was supposed to be "outside the range of normal human experience," and was conceptualized with death camps and life-threatening combat experiences as a model, this concept was steadily broadened. The recognition that the response to the stressor might be delayed (largely because it is maladaptive within the context of combat) was also broadened in unanticipated ways: for example, the diagnosis became widely used for adults who described themselves as being abused by their parents when young children. Subsequent revisions of *DSM* adapted to these applications by steadily broadening the definition of the stressor and modifying its relationship to the onset of the disorder in a variety of ways.

Guest editorial

Since the introduction of the concept of PTSD into psychiatric nomenclature in 1980, the controversy between the role of biological and psychological factors has re-emerged. The maturation of the discipline of neuroscience, which is now widely perceived as the “basic science of psychiatry,” has had a significant influence. The development of the tools of neuroimaging has provided an opportunity to conduct in vivo exploration of the brain in individuals who are diagnosed as suffering from PTSD. And the neuropsychiatric casualties of the wars in Iraq and Afghanistan, who have been exposed to new combat techniques and new types of combat stress much as occurred during World War I, have reawakened the controversy about the relationship between physical and psychological injuries. Terrorism, guerilla warfare, and patrols confronting IEDs (improvised explosive devices) and land mines have replaced the mortars and trench warfare of World War I. TBI has been called the “signature injury” for these wars, much as shell shock was during World War I. And the same policy issues concerning provision of pensions and health care for veterans are the subject of concern and debate, and they are informed by the same con-

trovery about “physical” vs “emotional” injuries; these have been the subject of three Institute of Medicine reports written to clarify diagnostic, treatment, and compensation issues.¹⁷⁻¹⁹

What is PTSD? And how is it related to TBI? There are still no easy answers to these questions. This issue of *Dialogues in Clinical Neuroscience* makes a significant and useful contribution to addressing them. It makes it clear that the disorders have many overlapping features, both symptomatically and biologically. It highlights the progress that has been made in understanding the underlying biology of both disorders by using the tools of neuroscience and neuroimaging. And this progress makes it clear that the old polarity between physical vs emotional underpinnings for PTSD is an antiquated way of thinking that is no longer useful in the 21st century. Whatever PTSD is, it is a disorder that cannot be dismissed as purely psychological or a refuge for malingerers. As this issue illustrates, psychological trauma has neurobiological effects, and these effects can now be visualized and measured in the living brain. To some extent, the legacy of the World War I controversy has finally been resolved.

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