



## Are We Winning the War Against Posttraumatic Stress Disorder?

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*Science* **336**, 872 (2012);  
DOI: 10.1126/science.1222069

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PERSPECTIVE

# ARE WE WINNING THE WAR AGAINST POSTTRAUMATIC STRESS DISORDER?

Richard J. McNally

The most methodologically rigorous epidemiological study on American military personnel deployed to Iraq and Afghanistan found that 4.3% of troops developed posttraumatic stress disorder (PTSD). Among deployed combatants, 7.6% developed PTSD, whereas 1.4% of deployed noncombatants did so. The U.S. Department of Veterans Affairs has launched a program ensuring that all veterans with PTSD will receive evidence-based cognitive-behavioral therapy, and the Army has developed Battlemind postdeployment early interventions that reduce risk for the disorder.

The outbreak of war in Afghanistan and Iraq prompted dire predictions about its likely psychiatric consequences. The chief of readjustment counseling services at the U.S. Department of Veterans Affairs (VA) conjectured that as many as 30% of troops deployed to Iraq might develop posttraumatic stress disorder (PTSD) (1), a syndrome that can emerge after exposure to horrific, life-threatening events, such as combat, natural disasters, and rape. PTSD sufferers do not merely remember their trauma; they reexperience it as vivid sensory recollections (flashbacks), nightmares, and intrusive thoughts. They feel numb and emotionally disconnected from loved ones, yet also tense, irritable, and hypervigilant as if danger were forever present.

Psychiatry ratified the PTSD diagnosis in 1980, chiefly in response to the belated recognition of its symptoms in Vietnam veterans whose problems had long been inadequately understood and treated. Indeed, the most rigorous epidemiological study ever done on Vietnam veterans had reported that 30.9% of men who served in this war developed PTSD (2), furnishing a basis for early predictions about PTSD among Iraq veterans. Keen to avoid the mistakes of the Vietnam era, American, British, and Dutch authorities launched epidemiological surveys assessing the mental health of troops returning from Iraq and Afghanistan, aiming to ascertain the prevalence of PTSD and enable its early detection and treatment.

## The Epidemiology of PTSD

A decade later, the data are in, and the implications are surprisingly optimistic. The wars have certainly caused PTSD, but at rates far lower than many had expected. The most methodologically sound surveys have assessed large numbers of military personnel (or veterans) randomly sampled from the overall population of American and British troops

who have served in Iraq and Afghanistan. These studies show that the proportion of troops that has developed PTSD ranges from 2.1 to 13.8%. (3)

The most rigorous study on American troops is the U.S. Millennium Cohort study, a population-based, longitudinal investigation of active duty and Reserve/National Guard personnel (4). It involves random samples representative of the subpopulations of deployed combatants, deployed noncombatants, and nondeployed noncombatants. Hence, it avoids the biases associated with convenience samples or from samples drawn from those seeking treatment. Moreover, the subjects were free of PTSD at baseline, providing estimates of PTSD attributable to military trauma alone and not to trauma occurring before a soldier's enlistment in the service. Assessing 47,837 members of the Armed Forces, the researchers found that 4.3% of personnel deployed to Afghanistan or Iraq developed PTSD. Among deployed personnel, 7.6% of those reporting combat exposure developed the disorder, whereas 1.4% did so among those not experiencing combat. Of those who had never deployed overseas, 2.3% developed PTSD in response to stateside trauma (such as accidents on military bases). To be sure, rates of 4.3% among all deployers and 7.6% among combatants are not trivial. Yet, these figures are much lower than the predicted figure of 30% for all deployed troops, noncombatants as well as combatants (1, 2).

A longitudinal study involving a subset of the Millennium Cohort provides further reason for cautious optimism. The researchers assessed PTSD symptoms before deployment to Afghanistan or Iraq and at two postdeployment follow-up assessments separated by a 3-year interval, enabling them to track the course of symptoms over time. (5) Among single- and multiple-deployers, respectively, 6.7 and 4.5% were healthy at baseline but were symptomatic at both follow-up assessments, which is suggestive of chronic PTSD directly attributable to war. Yet, most soldiers

deploying either once (83.1%) or multiple times (84.9%) were resilient, exhibiting a PTSD-free healthy trajectory across all three assessment points.

One limitation of these surveys is their reliance on questionnaire measures of PTSD. Although cost effective, this approach can overestimate PTSD relative to the "gold standard" of a structured clinical interview. For example, a study of 382 Dutch infantry veterans of Iraq yielded a questionnaire-based rate of PTSD of 21%, whereas structured interviews involving 339 of them revealed a rate of 4% (6). Some veterans apparently misunderstood certain questions, answered questions in reference to events unrelated to the war (such as receiving upsetting news from home), or experienced insufficient impairment to qualify for the diagnosis. Overestimates are less likely when questionnaire studies require that symptoms surpass stringent severity thresholds and that they produce social and occupational impairment.

## The Treatment of PTSD

Unexpectedly modest rates of PTSD among recent veterans do not justify complacency about the problem. Regardless of the prevalence of PTSD, removing obstacles to prompt, efficacious treatment is essential.

One obstacle is stigma about seeking help for mental health problems, which is a common concern among active duty troops, especially for those combatants reporting the most symptoms on anonymous surveys. Encouragingly, worries about stigma diminish in military units characterized by strong cohesion and excellent leadership (7).

Concern about stigma may lessen after personnel separate from the service. Among American veterans of Afghanistan and Iraq seeking any form of health care from the VA, 25% receive a mental health diagnosis, and 52% of these have PTSD (8). These data indicate that not all mental health problems constitute PTSD; others include depression, alcohol abuse, and difficulties readjusting to family life.

Nevertheless, the importance of PTSD has inspired a landmark VA initiative to ensure that veterans with the disorder receive either prolonged exposure (PE) or cognitive processing therapy (CPT) (9). Both are cognitive-behavioral therapies that have the strongest evidential support for treating the disorder, at least among civilian trauma victims. Before this initiative, less than 10% of VA clinicians specializing in the treatment of PTSD routinely used PE.

PE requires patients to recount traumatic memories repeatedly within a structured, supportive therapeutic context until distress declines. In addition to this imaginal exposure component, PE also involves gradual, systematic exposure to feared, but safe, reminders of the trauma in everyday life. CPT has patients recount their traumatic experiences repeatedly in writing. Both PE and CPT require therapists to identify and help

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patients' correct maladaptive beliefs about their symptoms and about the trauma.

To ensure widespread dissemination, the VA asked the developers of PE and CPT, Edna B. Foa and Patricia A. Resick, respectively, to oversee training workshops followed by intensive supervision of cases. The original subset of VA clinicians are now themselves training additional therapists, expanding the pool of clinicians equipped to deliver state-of-the-art, evidenced-based cognitive behavior therapy. Vital to this endeavor has been administrative support for the program, guaranteed time for therapists to deliver treatment optimally, and incentives and directives to ensure its maintenance.

Although randomized controlled trials (RCTs) are essential for confirming the efficacy of the program for recent veterans, initial data from one hospital are promising. Of the 66% of veterans of Iraq and Afghanistan who completed the PE program, 74% had posttreatment PTSD scores that fell well below the clinical cutoff for PTSD (10). If this study is any indication, veterans of the recent wars may have much better chances of recovery than did veterans of previous wars for whom PE was unavailable.

### The Prevention of PTSD

The emotional and financial costs of chronic PTSD are substantial. Ideally, prevention would be better than is treatment only after PTSD develops. This proactive approach characterizes the Comprehensive Soldier Fitness (CSF) program, which is delivered to all members of the Army regardless of their occupational specialty (such as clerk or combat infantryman) (Fig. 1). Just as training in boot camp builds physical fitness, CSF aims to build psychological fitness, drawing on principles of positive psychology to cultivate resilience in soldiers (11). Important goals include facilitating personal growth and inculcating skills to reduce risk for PTSD. Moreover, the CSF includes a module to help soldiers and their families manage the stress of prolonged deployments overseas (12).

Unfortunately, the Army implemented the program without first conducting a RCT to test whether CSF reduces the incidence of PTSD. That is, it would have been desirable to randomly assign certain brigades to receive the program and test whether it reduces rates of PTSD below that of brigades randomly assigned to receive the Army's standard program (13). Without such pilot testing, it will be difficult to tell whether any beneficial outcomes are attributable to CSF. In fact, RCTs have shown that some prevention programs in the mental health field have had unintended adverse consequences (14).

To say that we ought to prevent PTSD implies that we can do so, and it remains unclear how malleable risk factors for PTSD really are. Because most military personnel do not develop the disorder, one might argue that we should not allocate resources to efforts to prevent PTSD in

people unlikely to develop the disorder in the first place, including soldiers whose duties seldom place them in harm's way.

Hence, another option is to develop a preventive intervention, test whether it works, and then deliver it to high-risk groups. Targeting groups, not individuals, would also diminish the likelihood of stigma. Exemplifying this approach, the Army has developed postdeployment "Battlemind debriefing," which is an early intervention program for preventing psychological problems among platoons returning from combat duty (15). Unlike other debriefing methods that may impede recovery from trauma (16), Battlemind deemphasizes cathartic sharing of trauma stories within the group and focuses instead on the skills needed for a suc-

cessful transition from the combat zone to home. Group facilitators remind soldiers to trust their training, emphasizing how their mastery of military skills will render them resilient, and they provide tips on coping with the three common concerns of sleep difficulties, anger control, and interpersonal withdrawal.

standard postdeployment stress education program (15). Soldiers with the most combat exposure received the most benefit, reporting fewer symptoms of PTSD and depression, less difficulty sleeping, and less concern about stigma. Hence, soldiers most at risk for PTSD received the most benefit from this preventive intervention.

A RCT testing an anglicized version of post-deployment Battlemind training among UK military personnel returning from Afghanistan reduced binge drinking at 6-month follow-up relative to the standard stress debriefing but did not affect PTSD symptoms (17). However, the level of baseline PTSD symptoms was substantially lower than in the American RCT. Hence, there was little room for improvement.

### Conclusions

Dire predictions notwithstanding, the vast majority of troops deployed to Iraq and Afghanistan have been resilient, and the prospects for recovery for those who have developed PTSD have never been better as the VA ensures that veterans receive the best evidence-based care. Some preventive interventions show promise, too. Yet, the most hopeful development is the remarkable decline in the frequency, duration, and lethality of war, especially during the past 60 years (18). There are multiple likely causes of this decline (19), but identifying those subject to control is vital for fostering this positive trend. Indeed, steps that further the global decline in violence provide the surest route to preventing PTSD throughout the world today.



Fig. 1. Comprehensive Soldier Fitness logo. [Credit: U.S. Army]

cessful transition from the combat zone to home. Group facilitators remind soldiers to trust their training, emphasizing how their mastery of military skills will render them resilient, and they provide tips on coping with the three common concerns of sleep difficulties, anger control, and interpersonal withdrawal.

The Army has also developed postdeployment "Battlemind training" for larger groups of returning combat units. In this didactic intervention, leaders reframe common difficulties, such as hypervigilance, sleep difficulties, and emotional withdrawal that occur from the transition to home as adaptive combat skills that require adjustment. For example, leaders remind soldiers to apply the emotional bonding skills that they used in their combat units to reaffirm positive family relationships. They also emphasize positive cognition and coping skills.

A RCT revealed that both postdeployment Battlemind programs produced favorable outcomes at 4-month follow-up relative to the Army's

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**Acknowledgments:** I thank N. Breslau, D. M. Wegner, and S. Wessely for helpful comments on previous drafts of this article.

10.1126/science.1222069

PERSPECTIVE

# THE ANTIQUITY OF EMPATHY

Frans B. M. de Waal

The view of humans as violent war-prone apes is poorly supported by archaeological evidence and only partly supported by the behavior of our closest primate relatives, chimpanzees and bonobos. Whereas the first species is marked by xenophobia, the second is relatively peaceful and highly empathic in both behavior and brain organization. Animal empathy is best regarded as a multilayered phenomenon, built around motor mirroring and shared neural representations at basal levels, that develops into more advanced cognitive perspective-taking in large-brained species. As indicated by both observational and experimental studies on our closest relatives, empathy may be the main motivator of prosocial behavior.

After the devastations of World War II, humans were routinely depicted as “killer apes”—in contrast to the real apes, which were regarded as pacifists. Books by Konrad Lorenz, the Austrian ethologist, and Robert Ardrey, an American journalist, contributed to the idea that a hallmark of humanity is aggression. Until well into the 1980s, this remained the dominant theme of biological approaches to human behavior. This literature is now recognized as one-sided because it overlooked our species' capacity for cooperation, empathy, and prosocial behavior.

Species-typical tendencies normally come with built-in rewards. Nature has ensured that we find fulfillment in eating, sex, nursing, and socializing, all of which are necessary for survival and reproduction. If there were truly a genetic basis to our participation in lethal combat, we should willingly engage in it. Yet soldiers report a deep revulsion to killing and shoot at the enemy only under pressure (1). After these experiences, they often end up with substantial psychological damage. Far from being a recent phenomenon, haunting memories of combat were already known to the ancient Greeks, such as Sophocles, who described Ajax's “divine madness,” now known as posttraumatic stress disorder (PTSD).

Even though evidence for individual murder goes back hundreds of thousands of years, comparable signs of warfare (such as graveyards with weapons embedded in a large number of skeletons) are lacking from before the Agricultural Revolution [about 12,000 years ago (2)]. This is not to imply that war was absent before then, but it does mean that the common assumption that our ancestors waged perpetual wars and knew peace only at “precarious interludes” (as Winston Churchill sur-

mised) lacks solid archaeological backing. During most of our prehistory, we were nomadic hunter-gatherers, whose cultures are nowadays not particularly known for warfare (3). They do occasionally raid, ambush, and kill their neighbors (4), but more often trade with them, intermarry, and permit travel through their territories. Hunter-gatherers illustrate a robust potential for peace and cooperation.

Going back farther in time, we end up with *Ardipithecus ramidus*, a 4.4-million-year-old hominin that has been described as relatively peaceful, owing to its reduced canine teeth as compared to those of the chimpanzee (*Pan troglodytes*) (5), who can be lethally violent during territorial encounters between communities. However, the conclusion drawn from *Ardipithecus*' dentition that our ancestors were less war-prone than the apes is not rigorous unless the bonobo (*P. paniscus*), which also has relatively small canines (Fig. 1), is included. Despite being as closely related to us as chimpanzees, the behavior of bonobos fails to support traditional violence-based scenarios of human evolution. Deadly aggression among bonobos has thus far not been observed, neither in captivity nor in the wild, and xenophobia is only weakly developed. Bonobos sometimes mingle across territorial borders, where they engage in sex, grooming, and play. They are known as the “make love, not war” primates for solving dominance issues through sexual activity (6). Indeed, it has been suggested that these apes “may approach more closely to the common ancestor of chimpanzees and man than does any living chimpanzee” (7).

In addition, developments in psychology, neuroscience, behavioral economics, and animal behavior have begun to question the view, dominant until a decade ago, that animal life, and by extension human nature, is based on unmitigated competition. In primatology, the countermovement started with research into the survival value of friendships (8) and conflict resolution (9).

After the discovery that chimpanzees often kiss and embrace shortly after a fight within their group, numerous studies have documented “reconciliations” in nonhuman primates. Methodologies comparing postconflict observations with baseline data to determine how species members behave in the presence versus absence of previous antagonism show that primates are generally attracted to former opponents, seeking friendly contact especially if they otherwise enjoy a mutually beneficial relationship. Relationship value appears to drive post-conflict repair (10). The behavioral expression of reconciliation varies, but its general effect is a rapid return to preexisting levels of tolerance and affiliation. This reunion process has been reported for macaques, gorillas, golden monkeys, capuchins, and many other primates, but also for nonprimates, such as wolves, dolphins, and hyenas. Reconciliation is a common social mechanism that would be superfluous if social life were ruled entirely by dominance and competition.

The level of cooperation among nonhuman primates tends to be underappreciated. In order to set it apart from human cooperation with non-relatives, aid among primates is sometimes ascribed largely to kinship (11). This claim has not held up, however, on the basis of DNA extracted from chimpanzee feces in the wild. Males without genetic ties make up the majority of mutually supportive partnerships (12). The same seems to apply to bonobos. Female bonobos maintain a close social network that allows them to collectively dominate the majority of males despite the fact that females are also the migratory sex, which means that they are largely unrelated within each community (6). Both of our closest primate relatives are marked, therefore, by high levels of nonkin cooperation, probably explained by well-developed reciprocity.

Expressions of empathy are common in apes and resemble those of our own species. In child research, for example, a family member is typically instructed to feign distress or pain, upon which touching, stroking, and close-up eye-contact by the child is interpreted as a sign of sympathetic concern. In chimpanzees, bystanders at a fight go over to the loser and put an arm around his or her shoulders or provide other calming contact (Fig. 2). Data from several thousand postconflict observations in chimpanzees indicate that consolation reduces the recipient's arousal and follows the same sex difference as reported for sympathetic concern in children, with female apes providing comfort more often than males (13). Bonobos express the same tendency sociosexually by means

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