# Intermittent Explosive Disorder: A Predictor of Suicidal Ideation and Behavior in a Combat Population

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This dissertation by Erin K Bailey has been approved
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DOCTOR OF PHILOSOPHY

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**Abstract**

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High suicide rates among military personnel and veterans reflect a need to better understand risk factors for suicidal behaviors. Using data from the National Comorbidity Survey-Replication, the present study examined the role of recent (12-month) Intermittent Explosive Disorder (IED) diagnosis on lifetime history of suicidal ideation and behaviors (creating a suicide plan, attempting suicide) in 218 individuals who had previously participated in combat. In addition, we examined the relationship between morally injurious combat experiences and subsequent IED diagnosis. Twelve-month IED diagnosis was significantly associated with all three suicide variables and was a significant predictor of suicidal ideation over and above 12-month PTSD and Major Depressive Disorder. The odds of a combat veteran, who met diagnostic criteria for 12-month IED, reporting past suicidal ideation were 6.20 times greater than those without the diagnosis. For suicide plan and suicide attempts, the odds increase to 5.69 and 7.24 times greater for those with 12-month IED, respectively. Twelve-month IED was not significantly associated with any of the examined combat variables or PTSD. Consistent with published research, morally injurious combat variables significantly predicted 12-month PTSD in this sample. The results of the present study are preliminary and represent an initial examination of IED in a combat population.

**Dedication**

This doctoral dissertation is dedicated in three parts.

To the men and women who have served in the United States military, I thank you from the bottom of my heart.

To my family – Scott, Leslie, Clint, and Helen – and my amazing friends, you give my life meaning.

And lastly, to myself. For every challenge that I have overcome.

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# CHAPTER I

## Statement of the Problem

Overall, suicide is the second leading cause of death in military populations (Center for Disease Control and Prevention, 2009). Between 1993 and 1998, suicide was the second leading cause of death among male veterans and the first among female veterans (Wiebe, Conigliaro, Richmond, & Branas, 2006). Completed suicide among military and veteran personnel has risen dramatically in the last few years. In 2008, the US Army experienced an all-time high with regard to completed suicides (i.e. suicides resulting in the death of an individual; Kuehn, 2009). However, the Associated Press cited July 2012 as the worst month for Army suicides since 2009, nearly doubling from the previous month. It is estimated that the rate is approaching one military suicide per day, with deaths surpassing rates of those killed in action in Afghanistan (Associated Press, 2012).

Examining suicidal ideation and behaviors may aid clinicians in identifying those individuals most at risk for completed suicide. For example, in a study of 185 veterans, Kleepies et al. (2001) found that individuals who had planned self-injury exhibited a higher intent to die – an identified risk factor for completed suicide (Harriss, Hawton, & Zahl, 2005). Additionally, research indicates that the best predictor of completed suicide is a past attempt (Sundararaman, Panangala, & Lister, 2008). Given the rise in military suicide over recent years, psychological research should continue to identify patterns of risk factors for suicidality among veteran populations (Genderson, Schonfeld, Kaplan, & Lyons, 2009).

Although research (Kang & Bullman, 2008) indicates that the suicide rate in the overall military population does not differ from the general public, these results may be misleading. Vulnerable subgroups, such as the Army and Marine Corps have higher rates than the national average (Eaton et al., 2006; Kang & Bullman, 2008) and may be at risk for suicide attempts and completed suicide. These branches may also be more likely to be exposed to combat situations, which may fuel suicidal behaviors.

The impact of psychological factors on suicide risk has been thoroughly documented (Capron, et al., 2012; Brown, Beck, Steer, & Grisham, 2000; Kotler, Iancu, Efroni, & Amir, 2001; Maguen et al., 2011; Mann et al., 1999; Nock et al., 2008; Sokero et al., 2005; Vandivort & Locke, 2010). Overall, veterans who have been exposed to combat are at higher risk for mental health problems, such as PTSD, and depression (Bailey, n.d.; Maguen et al., 2011; Morissette, 2011), which are risk factors for both suicidal ideation and suicidal action (Nock et al., 2008; Sareen, et al., 2007). Moreover, the risk of suicidal behaviors increases when risk factors co-occur (Nock et al. 2008) and studies that examine risk factors for suicidal behaviors will help clinicians to better identify vulnerable subgroups and aid practitioners in developing effective preventative interventions.



Previous research has also indicated that the varying types of combat experiences may lead to differential patterns of psychological stress. For example, Maguen et al. (2009) used existing data from the National Vietnam Veterans Readjustment Survey (NVVRS) to examine the relationships between different types of combat experiences and subsequent PTSD in a sample of 1,200 male Vietnam veterans. The researchers found that, even after controlling for other aspects of combat, killing another person was

significantly predictive of PTSD, as well as disassociation, functional impairment, and violent behavior.

In a follow-up study, Maguen et al. (2011) examined the relationship between suicidal ideation and killing in combat (Maguen et al., 2011). Using a sample of 2,854 returning Operation Iraqi Freedom (OIF) soldiers, they examined suicidal ideation, PTSD, depression, as well as whether a soldier had killed another person in combat. They found that while killing in combat was predictive of subsequent suicidal ideation, PTSD and depression mediated the relationship between killing and suicidal ideation in their sample. These research studies provide a deeper understanding as to the differential relationship between types of combat experiences, psychiatric conditions, and suicidal ideation.

As features of PTSD (Joseph, Dalgleish, Thrasher, & Yule, 1997; Taft et al., 2007), anger and impulsivity have both been documented in individuals following traumatic experiences (Dyer at al., 2009, Chemtob et al., 1997). However, anger and impulsivity may be individual risk factors for suicidality independent of PTSD (Chemtob et al. 1994; Kotler et al., 2001), as well as predictive of suicidality when combined into one construct (Mann et al., 1999). Intermittent Explosive Disorder (IED), a psychiatric condition characterized by impulsive acts of explosive anger, has been documented in traumatized populations (Fincham et al, 2009; Nickerson, Aderka, Bryant, & Hofmann, 2012; Silove et al., 2009) and has also been implicated in risk for both suicidal ideation (Bromet et al., 2007) and behaviors (Bromet, et al., 2007; McCloskey, et al., 2008). To our knowledge there are no research studies to date that specifically examining how IED relates to suicidality and different types of combat experiences.

**Research Aims**

The present study seeks to expand on the aforementioned studies by including suicidal behaviors (such as creating a suicide plan and attempting suicide), in addition to suicidal ideation, as an outcome measure in the relationship between combat experiences and psychiatric conditions. Moreover, the above-mentioned studies provide justification for taking into account both depression and PTSD when examining the relationship between combat experiences and suicidal behaviors. It is possible that, in the current study, depression and PTSD will also mediate the relationship between combat experiences and suicidal behaviors such as creating a plan for suicide or attempting suicide. Depression and PTSD should also be accounted for due to overlapping symptomology with Intermittent Explosive Disorder.

Overall, there is a paucity of research clarifying the role of IED as a potential unique predictor of suicidal ideation and behaviors after taking PTSD, depression, and combat experience into account. In addition, existing research has not examined the relationships between these variables in predicting suicidality together in one model. If IED is found to both relate to violent combat experiences and predict suicidal behaviors after accounting for PTSD and depression, current clinical practices for treatment combat veterans who exhibit suicidal behaviors may need to be modified in order to address the unique experience of IED. While the Department of Defense encourages anger management skills training as an intervention for PTSD recovery (Department of Veterans Affairs, 2007), the results of the present study may support additional anger management and impulse-control interventions for suicide prevention among military veterans. The following literature review describes identified predictors of suicidal

ideation and/or behavior in the literature and outlines a rationale for why IED should be examined in conjunction with existing predictors of suicidality.

CHAPTER II

## Review of Literature

The Reinforcement Sensitivity Theory (RST) developed by J.M. Gray (1972; 1988) identifies two main personality-based pathways of motivational activation in response to stress: the behavioral activation system (BAS) and the behavioral inhibition system (BIS), broadly referred to as *approach* and *avoidance*, respectively (Carver, Sutton, & Scheier, 2000; Elliot & Thrash, 2002). Comparable to the flight-or-flight mechanism (Cannon, 1929), these motivational systems are activated based on certain stressful environmental situations.

Neurological research identifies some degree of anterior cortical (AC) asymmetry in human's emotional processing and motivational systems (Davidson, 1992). Decreased activity in the left AC region has been identified in depressed individuals, while right anterior lesions result in mania-like symptoms (Harmon-Jones & Allen, 1998; Robinson & Downhill, 1995). Electroencephalographic (EEG) studies have provided evidence of resting alpha-band asymmetry (8-13 Hz) for different motivational systems (Harmon-Jones & Allen, 1998, Davidson, 1992) – with some degree of laterality suggestive of separate systems of emotional processing of approach (left frontal activation) and avoidance (right frontal activation) affect. As features of affective disorders (e.g. Posttraumatic Stress Disorder, Intermittent Explosive Disorder), emotions such as shame, anger, and impulsivity can be conceptualized in terms of avoidance and approach systems. Posttraumatic stress disorder has been identified as a risk factor for suicidality among veteran populations (Capron, et al., 2012; Hendin & Haas, 1991; Sareen, et al.,

2007). However, given overlapping symptomology with other emotionally deregulating disorders (i.e. PTSD, MDD) the link between suicidality and IED remains less clear.

**Posttraumatic Stress Disorder**

Avoidance systems can be operationalized as a process in which an individual avoids aversive circumstances (Carver & Harmon-Jones, 2009). This system is based in anxiety and fear of what might happen should the individual initiate goal-oriented behavior**.** Posttraumatic stress disorder has been described as an imbalance of motivation systems with the downregulation of approach associated with characteristic emotional numbing and upregulation of avoidance associated with both behavioral avoidance and hyperarousal (Stein & Paulus, 2009). Considering the aversive nature of war experiences, PTSD is often prevalent in military and veteran populations following combat.

Research estimates that 13% of military personnel utilizing health care services meet diagnostic criteria for PTSD (Seal, et al., 2007). One study found that PTSD and major depression cost the Department of Defense (DoD) approximately 204.6 million dollars over two years, including the cost of suicide (Tanielian & Jaycox, 2008). Another study found that combat-induced PTSD costs the US Health Care System approximately $1.5 to $2.7 billion dollars over two years (Cesur, Sabia, & Tekin, 2011).

Rates of PTSD have been shown to increase following deployment and are linearly related to the length of deployment, with longer deployment lengths correlated with greater risk for PTSD (Adler, Huffman, Bliese, & Castro, 2005). However, the effect of deployment length on mental health outcomes diminishes when considering number of firefights (exchange of gunfire; Cesur et al., 2011). Therefore, the linear effect of deployment length on risk for PTSD may be mediated by the exchange of gunfire and