Longitudinal Study of Risk and Resilience in National Guard Soldiers Deployed to the Wars in Iraq and Afghanistan

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Overview
Background on the Wars in Afghanistan (Operation Enduring Freedom; OEF) and Iraq (Operation Iraqi Freedom; OIF)
Review literature on risk and resiliency in combat veterans
Results from a longitudinal study of National Guard soldiers deployed to Iraq

Background
- Over 1.8 million U.S. troops deployed to OEF/OIF
- High levels of combat exposure
- Elevated risk for mental health problems

Combat Experiences Reported by Soldiers Returning from OEF/OIF

<table>
<thead>
<tr>
<th>Experience</th>
<th>Afghanistan (N=1962)</th>
<th>Iraq (N=894)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being shot at or receiving small-arms fire</td>
<td>66%</td>
<td>93%</td>
</tr>
<tr>
<td>Being attacked or ambushed</td>
<td>98%</td>
<td>89%</td>
</tr>
<tr>
<td>Receiving incoming artillery, rocket, or mortar fire</td>
<td>84%</td>
<td>86%</td>
</tr>
<tr>
<td>Knowing someone seriously injured or killed</td>
<td>43%</td>
<td>86%</td>
</tr>
<tr>
<td>Shooting or directing fire at the enemy</td>
<td>27%</td>
<td>77%</td>
</tr>
<tr>
<td>Seeing dead bodies or human remains</td>
<td>39%</td>
<td>95%</td>
</tr>
<tr>
<td>Being responsible for the death of enemy combatant</td>
<td>12%</td>
<td>48%</td>
</tr>
<tr>
<td>Engaging in hand-to-hand combat</td>
<td>7%</td>
<td>12%</td>
</tr>
<tr>
<td>Being wounded or injured</td>
<td>5%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Hoge et al., 2004
Exposure to Traumatic Events is Common, but PTSD is Not

- Epidemiological studies estimate that life time exposure to a traumatic event in the general population is 50% to 60% (Kessler et al., 1995; Kessler et al., 2005).
- Yet only 5-10% of exposed individuals develop PTSD (Kessler et al., 1995; Ozer et al., 2003).

PTSD among Combat Veterans

- Rates of PTSD are higher among combat veterans than general population
  - National Vietnam Veterans Readjustment Study – 9-15% (Kulka et al., 1990; Dohrenwend, 2006)
  - Gulf War I – 3-16% (Ziebert et al., 1993; Wolters et al., 1999)
  - OEF/OIF – 12% (Mage et al., 2014)
- Most common reaction to combat is resilience

Trauma and Resilience

Resilience is the ability of adults in otherwise normal circumstances who are exposed to an isolated and potentially highly disruptive event, such as a violent or life-threatening situation, to maintain relatively stable, healthy levels of psychological and physical functioning

Prototypical Patterns of Disruption in Normal Functioning Across Time Following Potentially Traumatic Events

Growth Mixture Modeling

- Trajectory models are increasingly being applied to questions related to the development of mental disorders over time.
- Designed to identify clusters of individuals following a similar developmental trajectory on an outcome.
- Allow examination of predictors (risk and protective factors) of trajectory group membership.

Evidence from longitudinal studies

- Civilian Populations
  - Resilient (35-60%), Chronic (10-42%), Recovery (10-23%), and Delayed Onset (02-17%) trajectories.
- Military Populations
  - Gulf War I veterans - Resilient trajectory (57%) predicted by gender, race, education, lower levels of combat exposure (Orcutt et al., 2004).
  - US soldiers deployed on 6-month NATO-led peacekeeping mission to Kosovo: Resilient (60%), Chronic (10%), Recovery (14%), Delayed (17%) (Dickstein et al., 2010).
  - Little known about factors predicting course.

Risk Factors for PTSD

“One weekend a month, 2 weeks a year.”
Department of Defense Data on Rates of PTSD Screening in NG/R vs. Active Duty Troops

National Guard Status as a Risk Factor
- Demographics (older, married with children)
- Civilian roles (leaving jobs and careers behind)
- Training and deployment experiences
- Re-deployment work challenges
- Re-deployment social/Unit support
- Re-deployment access to health care

Limitations of Existing Research
- Often based on cross-sectional studies
  - Provide only a snapshot at one point in time
  - Can’t inform us about changes over time
- Often retrospective in nature
  - Confuses directions of causality
  - Can’t rule out pre-existing concerns or problems
- Based on active duty personnel
  - Findings may not generalize to NG/R service members

Readiness and Resilience in National Guard Soldiers (RINGS) Cohort Study
Soldiers from the 1st Brigade Combat Team, 34th Infantry Division of the MN ARNG (1/34 BCT)
Mobilized in September 2005 – 6 months training at Camp Shelby, Mississippi
Deployed March 2006 to July 2007
Goals of the RINGS Cohort Study

To identify *pre-deployment* factors predictive of subsequent:
- Mental health problems
- Health care utilization
- Military retention and attrition
in a cohort of National Guard soldiers

Participants

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Cohort (n =522)</th>
<th>BCT (n =2573)</th>
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<tbody>
<tr>
<td>Gender (% Male)</td>
<td>88.5%</td>
<td>90.1%</td>
</tr>
<tr>
<td>Mean Age, Yrs (SD)</td>
<td>29.1 (8.6)</td>
<td></td>
</tr>
<tr>
<td>% Married</td>
<td>45.4%</td>
<td>39.9%</td>
</tr>
<tr>
<td>Race (% Caucasian)</td>
<td>92.9%</td>
<td>94.7%</td>
</tr>
<tr>
<td>Rank (% Enlisted)</td>
<td>90.2%</td>
<td>89.4%</td>
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Study Design

- **Time 1**: Pre-deployment (1 month)
  - Pre-Deployment Risk/Resilience Factors
  - Personality
  - Current Psychiatric Distress
- **Time 2**: Post-deployment (2-3 months)
  - Deployment Risk/Resilience Factors
  - Personality
  - Mental Health and Social Functioning
  - Healthcare Utilization
  - Military Retention/Attrition
- **Time 3**: Post-deployment (1 year)
  - Post-Deployment Experiences
  - Mental Health and Social Functioning
  - Healthcare Utilization
  - Military Retention/Attrition
- **Time 4**: Post-Deployment (2 years)
  - Post-Deployment Experiences
  - Mental Health and Social Functioning
  - Healthcare Utilization
  - Military Retention/Attrition

Pre-Deployment Data Collection

- Investigators traveled to Camp Shelby, MS and administered pre-deployment surveys to 522 soldiers about 1 month prior to their deployment to Iraq
Post-Deployment Data Collection

- Post-deployment surveys were collected via standard mail survey methodology
- Structured clinical interviews were conducted at Time 2 (n = 355; 68% response rate)
- Response rates
  - Time 2 = 81% (n = 424)
  - Time 3 = 66% (n = 343)
  - Time 4 = 57% (n = 296)
- Analyses of responders and non-responders revealed no significant differences on relevant pre-deployment variables

Measures: Psychological Health Outcomes

- PTSD Checklist (PCL-C at Time 1, PCL-M at Time 2)
- Beck Depression Inventory (BDI-II)
- Patient Health Questionnaire-15 (Somatic Complaints)
- Alcohol Use Disorder Identification Test (AUDIT)
- Social Adjustment Scale-Self Report (SAS-SR)
- Navy Quality of Life Survey
- Structured Clinical Interview for DSM-IV (SCID-IV)
- Clinician Administered PTSD Scale (CAPS)

Measures: Pre-Deployment Risk/Protective Factors

- Abbreviated MMPI-2 RC scales
  - Negative Emotionality (NEM)
  - Positive Emotionality (PEM)
  - Disconstraint (CON)
- Selected scales from the Deployment Risk and Resilience Inventory (DRRI)
  - Prior Stressors
  - Childhood Family Environment
  - Preparedness
  - Unit Support
  - Concerns about Family/Life Disruptions
  - Demographics (Gender, age, rank)

Measures: Deployment and Post-Deployment Risk/Protective Factors

- DRRI scales assessing deployment experiences:
  - DRRI Combat Experiences Scale
  - DRRI Aftermath of Battle Scale
- DRRI scales assessing post-deployment variables:
  - Post-Deployment Social Support
  - Post-Deployment Life Stressors
Deployment Experiences

- 93% reported being exposed to or witnessing an explosion (such as an IED, RPG, landmine, grenade, mortar rounds, or rocket attack).
- 93% received hostile incoming enemy fire
- 91% went on combat patrols or missions
- 57% were in a unit that suffered casualties in battle
- 56% were in a vehicle under fire
- 58% witnessed severely wounded or disfigured American/allies
- 46% took care of injured or dying people
- 12% wounded or injured in combat
Longitudinal Course of PTSD Symptoms: 3 Class GMM Solution

Multinominal Logistic Regression for Predictors of Trajectory Class Membership

- Predictors of Vulnerable-Risk Trajectory:
  - Higher in personality dimension of neuroticism prior to deployment (OR = 1.34)
  - Worry about family, job, life disruption before deployment (OR = 1.13)
  - Combat exposure (OR = 1.17)

- Predictors of Chronic Trajectory:
  - Higher in personality dimension of neuroticism
  - Life stressors pre- and post-deployment (OR = 1.13, 1.75)
  - A sense of not being prepared for deployment (OR = 0.94)
  - Post-deployment social support (OR = 0.99)

Implications & Future Directions

- Protective impact of soldiers’ sense of preparedness (self-efficacy) on resilience
- Negative impact of family concerns on chronic trajectory of PTSD symptoms beginning prior to deployment
- Possible depletion of resources
  - Decreased available support for soldier from home before/during/after deployment
  - Increased stressors and strains may be related to family concerns
- Post-deployment social support often comes from the family
- RINGS-2
RINGS Research Team

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