



National Center for
PTSD
POSTTRAUMATIC STRESS DISORDER

Manual for the Deployment Risk & Resilience Inventory-2 (DRRI-2)

A Collection of Measures for Studying Deployment-Related Experiences of Military Veterans

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Part One: Introduction

Summary Description of the DRRI-2

This manual describes the development of the Deployment Risk and Resilience Inventory-2 (DRRI-2), an updated suite of 17 distinct scales that can be used to assess deployment-related risk and resilience factors, and provides information on administration, scoring, and psychometric properties of DRRI-2 scales. The DRRI-2, which builds on the original DRRI, is the product of a four-year Department of Veteran Affairs-sponsored research program, funded by two consecutive grants from VA Health Services Research and Development Service¹. The primary objective of the current research effort was to update the DRRI's assessment of deployment-related factors to ensure the instrument's applicability across a variety of deployment circumstances (e.g., different eras of service) and military subgroups (e.g., men and women), as well as to validate updated measures in a contemporary Veteran cohort. Consistent with the original work on the DRRI, the overall aim of the DRRI-2 project was to provide a research inventory of risk and resilience measures that can be used to assess deployment-related factors that have implications for Servicemembers' and Veterans' long-term health. The DRRI-2 assesses 17 risk and resilience factors:

- 2 Predeployment Factors: *prior stressors* (18 items) and *childhood family functioning* (12 items)
- 12 Deployment Factors: *difficult living and working environment* (14 items), *combat experiences* (17 items), *aftermath of battle* (13 items), *nuclear, biological, or chemical (NBC) exposures* (13 items), *perceived threat* (12 items), *preparedness* (10 items), *deployment support from family and friends* (8 items), *unit social support* (12 items), *general harassment* (8 items), *sexual harassment* (8 items), *concerns about life and family disruptions* (15 items), *family stressors* (14 items)
- 3 Postdeployment Factors: *postdeployment stressors* (14 items), *postdeployment social support* (10 items), and *postdeployment family functioning* (12 items).

Importantly, the measures that comprise the DRRI-2 are not subscales that are summed to create a total "deployment experience" score; instead, they are distinct scales that address different but related factors that may contribute to postdeployment health. **Therefore, any one or more of these scales may be used individually, depending upon the needs of the researcher.** This inventory of scales was recently updated via a multi-phase psychometric endeavor that included: (a) an initial concern for content validity informed by a comprehensive analysis of the literature and focus groups with Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF) Veterans; (b) a national mail survey of male and female OEF/OIF Veterans to assess initial item and scale characteristics for proposed new and modified DRRI scales, and to evaluate the psychometric quality of the updated scales vis-à-vis the original DRRI; and (c) a second national mail survey to examine the newly developed DRRI-2 scales' discriminant validity, criterion-related validity, and discriminative validity, and to confirm the psychometric quality of finalized DRRI-2 scales in a new sample of OEF/OIF Veterans.

This manual is intended as a resource for users of the DRRI-2. The manual for the original DRRI is also available upon request.

Rationale for the DRRI and DRRI-2

The impact of deployment and especially war-zone experiences on the health and well-being of military Veterans is undeniable. Indeed, deployment exposures are associated with an array of negative mental health outcomes, including posttraumatic stress disorder (PTSD), depression, anxiety, and substance abuse. In the wake of recent military deployments, including the Gulf War, Operation Enduring Freedom (OEF), and Operation Iraqi Freedom (OIF), there has been keen interest in how specific deployment exposures might lead to physical health problems as well. Additionally, some researchers have examined the potential for positive consequences of deployment

¹ Specific funding sources: Department of Veterans Affairs, Health Services Research and Development Service grants "Further Development and Validation of the DRRI" (DHI 05-130-3), Dawne Vogt, Principal Investigator, and "Validation of Modified DRRI Scales in a National Sample of OEF/OIF Veterans," (DHI 09-086), Dawne Vogt, Principal Investigator.

experiences, including an enhanced appreciation for life, greater attainment of life goals, and closer interpersonal relationships. Hence, the continued development of the DRRI is responsive to the growing interest in deriving a better understanding of deployment-related factors that have implications for Veterans' long-term well-being.

At the time that the original DRRI was developed, a review of the literature revealed a lack of measures of deployment-related stressors that were reliable and valid for assessing the experiences of contemporary deployments. For example, while there were a number of well-accepted measures of combat exposure, they were developed for previously deployed cohorts, and most notably, for Vietnam Veterans. This was problematic because the combat-related experiences that characterize present-day deployments are likely to differ from those of earlier conflicts. Moreover, there was a growing body of research demonstrating the salience of other deployment factors, as examples, perceived threat, exposure to the aftermath of battle, and the general milieu of distressing or uncomfortable living conditions. The deployment of a much larger proportion of women and National Guard and Reserve personnel in the context of an all-volunteer military force called attention to additional stressors, such as sexual harassment and concerns about life and family disruptions, that were not considered of research importance for previous cohorts of Veterans. Therefore, a broader assessment of the experiences of contemporary deployments was needed, and the original DRRI responded to that need by indexing a variety of risk and resilience factors important to modern deployments.

Since the DRRI was first released to the field in 2003, there has been a great deal of interest in these measures among researchers. In addition to being used in a number of large-scale, high-profile studies, the DRRI has also appeared in an ever-growing number of publications in peer-reviewed journals. Further, while the DRRI was developed as a research tool, the measures have also been adapted by clinicians to obtain information about deployment experiences that can inform the application of diagnostic tools and interventions.

Recognizing that the psychometric quality of measures can decline over time as the content of instruments becomes less relevant for respondents, a multi-phase project was recently undertaken to update the DRRI and validate updated scales in a sample of contemporary war Veterans. Changes reflected in the DRRI-2 include an updated assessment of warfare experiences and an expanded coverage of key family environment-related factors throughout predeployment, deployment, and postdeployment phases. A secondary goal in updating the DRRI was to provide shorter scales, when possible, by identifying items that could be eliminated without compromising the overall psychometric quality of the measures.

DRRI-2 Constructs

As noted above, the 17 DRRI-2 scales fall into three general categories: predeployment factors, deployment factors, and postdeployment factors. The deployment factors can be further categorized as mission-related factors or interpersonal factors. Definitions for these constructs are provided below:

Predeployment Factors:

Prior Stressors: Exposure to traumatic events before deployment, such as community or domestic violence, physical assault, sexual abuse, previous combat experiences, or other highly stressful life events.

Childhood Family Functioning: Quality of family relationships in the family of origin in terms of communication (e.g., getting along well with family members) and closeness (e.g., being affectionate with family members).

Deployment Factors:

Mission-Related Factors

Difficult Living and Working Environment: Exposure to events or circumstances representing repeated or day-to-day irritations and pressures related to life during military deployment. These personal discomforts or deprivations may include the lack of desirable food, lack of privacy, poor living arrangements, uncomfortable climate, cultural difficulties, and constraints to performing one's duties.

Combat Experiences: Exposure to combat-related circumstances such as firing a weapon, being fired on, being attacked or witnessing an attack (e.g., encountering an explosive device), encountering friendly fire, and going on special missions and patrols that involve such experiences. This war-zone factor refers to objective events and circumstances and does not include personal interpretations or subjective judgments of the events or circumstances.

Aftermath of Battle: Exposure to the consequences of combat, including observing or handling human remains, interacting with detainees or prisoners of war (POWs), and observing other consequences such as devastated communities and homeless refugees. This factor is also conceptualized as cataloging more objective war-zone events and circumstances.

NBC Exposures: Endorsed exposures to an array of nuclear, biological, and chemical agents that the Veteran believes he/she encountered while serving in the war zone, such as disease prophylaxis, environmental, and weaponry-related agents.

Perceived Threat: Fear for one's safety and well-being during deployment, especially as a response to potential exposure to warfare (e.g., attacks by enemy combatants, encountering explosive devices), as well as nuclear, biological, and chemical agents (NBCs) in the war zone (e.g., depleted uranium in munitions, pesticides or other routinely used chemicals). This factor reflects emotional or cognitive appraisals of situations that may or may not accurately represent objective or factual reality.

Preparedness: Extent to which an individual perceives that he/she was prepared for deployment. This includes the extent to which military personnel believe they had the equipment and supplies they needed and were trained to perform necessary procedures and tasks using equipment and supplies. This also includes the extent to which Servicemembers felt they were prepared for what to expect in terms of their role in the deployment, what it would be like in the region, and how to operate as a unit.

Interpersonal Factors

Deployment Support from Family and Friends: Extent to which an individual perceived emotional sustenance and instrumental assistance from family and friends *back home* during deployment. Emotional sustenance refers to the extent to which others provide the individual with understanding, companionship, a sense of belonging, and positive self-regard (e.g., feeling cared for by family members and friends, having people to talk to about problems). Instrumental assistance refers to the extent to which the individual receives tangible aid such as help to accomplish tasks and material assistance or resources (e.g., being able to count on people to take care of finances or belongings while deployed).

Unit Social Support: Extent to which an individual perceived assistance and encouragement in the war zone from fellow unit members (i.e., felt a sense of closeness and camaraderie with peers in the unit) and unit leaders (i.e., felt appreciated by superiors and believed that they were interested in one's personal welfare).

General Harassment: Exposure to harassment that is non-sexual but that may occur on the basis of one's biological sex or minority or other social status. Categories of harassment include constant scrutiny, questioning one's ability and commitment, and threats to safety.

Sexual Harassment: Exposure to unwanted sexual contact or verbal conduct of a sexual nature from other unit members, commanding officers, or civilians during deployment that contribute to a hostile working environment.

Concerns About Life and Family Disruptions: Worries that deployment might negatively affect other important life domains. These include primarily family-related concerns (e.g., damaging relationships with spouse or children or missing significant events such as birthdays, weddings, graduations, and deaths), as well as career-related concerns (i.e., losing a job or otherwise harming one's career).

Family Stressors: Exposure to stressful family experiences during the time of deployment. These objective stressors include experiences such as family adjustment issues, family illnesses, infidelity, family financial problems, and having a relationship end.

Postdeployment Factors:

Postdeployment Stressors: Exposure to stressful life events after the deployment, including both generally stressful events that are unrelated to the deployment, such as physical or sexual assaults, being robbed, and death or serious illness of someone close, and events that may be related to challenges associated with reintegration, such as job interruption, financial difficulties, and divorce.

Postdeployment Social Support: The extent to which family, friends, and individuals within the community provide emotional sustenance and instrumental assistance. Emotional sustenance refers to the extent to which others provide the individual with understanding, companionship, a sense of belonging, and positive self-regard (e.g., making the individual feel proud of his or her service, offering advice when needed). Instrumental assistance refers to the extent to which the individual receives tangible aid such as help to accomplish tasks and material assistance or resources (e.g., helping the individual with daily chores, lending the individual money).

Postdeployment Family Functioning: Quality of postdeployment family relationships in terms of communication (e.g., getting along well with family members), and closeness (e.g., being affectionate with family members).

Sample Items

Table 1 contains sample items and the response format for each DRRI-2 scale. The section (A through P) and label for each measure (as it appears in the DRRI-2 itself) are also provided.

Table 1
DRRI-2 Scales, Sample Items, and Response Formats

Scale	Section	DRRI-2 Label	Sample Items	Response Format
Predeployment Factors				
PRIOR STRESSORS	A	Predeployment Life Events	Before deployment... ...I experienced a natural disaster (for example, a hurricane), a fire, or an accident in which I or someone close to me was hurt or had serious property damage. ...I went through a divorce or was left by a significant other. ...I witnessed someone being seriously assaulted or killed.	Dichotomous items (0 = No; 1 = Yes).
CHILDHOOD FAMILY FUNCTIONING	B	Childhood Family Experiences	During childhood... ...I felt like I fit in with my family. ...family members knew what I thought and how I felt about things. ...I got along well with my family members.	5-point Likert response format (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i>).
Deployment Factors				
DIFFICULT LIVING AND WORKING ENVIRONMENT	C	Deployment Environment	During deployment... ...I didn't have access to bathrooms or showers when I needed them. ...my daily activities were restricted because of local religious or ethnic customs. ...I did not have adequate shelter from uncomfortable living conditions (for example, heat, cold, wet, etc.).	5-point Likert response format (1 = <i>Almost none of the time</i> ; 5 = <i>Almost all of the time</i>).

Scale	Section	DRRI-2 Label	Sample Items	Response Format
COMBAT EXPERIENCES	D	Combat Experiences	During deployment... ...I personally witnessed someone from my unit or an ally unit being seriously wounded or killed. ...I was exposed to hostile incoming fire. ...I was involved in locating or disarming explosive devices.	6-point Likert response format (1 = <i>Never</i> ; 6 = <i>Daily or almost daily</i> .)
AFTERMATH OF BATTLE	E	Postbattle Experiences	During deployment... ...I saw refugees who had lost their homes or belongings. ...I saw civilians after they had been severely wounded or disfigured. ...I interacted with detainees or prisoners of war.	6-point Likert response format (1 = <i>Never</i> ; 6 = <i>Daily or almost daily</i> .)
NBC EXPOSURES	F	Exposure to Nuclear, Biological, or Chemical Agents	Either in preparation for or during my deployment... ...I was exposed to mustard gas or other blistering agents. ...I was exposed to depleted uranium in munitions. ...I was exposed to nuclear, biological, or chemical weapons.	Polytomous items (0 = <i>No</i> ; 1 = <i>Not sure</i> ; 2 = <i>Yes</i>).
PERCEIVED THREAT	G	Deployment Concerns	During deployment... ...I was concerned that I would encounter an explosive device (for example, a roadside bomb, mine, or booby trap). ...I was concerned that I might be exposed to depleted uranium in munitions. ...I was concerned about being trapped in the crossfire of rival factions.	5-point Likert response format (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i>).
PREPAREDNESS	H	Training and Deployment Preparation	In preparation for deployment... ...the training I received made me feel confident in my ability to use my equipment. ...I was accurately informed about the role my unit was expected to play in the deployment. ...my unit was well-prepared to operate as a team during deployment.	5-point Likert response format (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i>).
DEPLOYMENT SUPPORT FROM FAMILY AND FRIENDS	I	Support from Family/Friends	During deployment... ...I had family members or friends at home I could talk to when I had a problem. ...relatives or friends at home could be counted on to take care of my finances, property, or belongings if needed. ...people at home did things to show they cared about me.	5-point Likert response format (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i>).
UNIT SOCIAL SUPPORT	J	Unit Support	During deployment... ...my fellow unit members appreciated my efforts. ...members of my unit were interested in my well-being. ...I could go to unit leaders for help if I had a problem or concern.	5-point Likert response format (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i>).

Scale	Section	DRRI-2 Label	Sample Items	Response Format
GENERAL HARASSMENT	K-1 (Items 1-8)	Relationships During Deployment	During deployment, the people I worked with... ...treated me as if I had to work harder than others to prove myself. ...questioned my abilities or commitment to perform my job effectively. ..."put me down" or treated me in a condescending way.	4-point Likert response format (0 = <i>Never</i> ; 3 = <i>Many times</i>).
SEXUAL HARASSMENT	K-2 (Items 9-16)	Relationships During Deployment	During deployment, the people I worked with... ...made crude and offensive sexual remarks directed at me, either publicly or privately. ...used a position of authority to pressure me into unwanted sexual activity. ...touched me in a sexual way against my will.	4-point Likert response format (0 = <i>Never</i> ; 3 = <i>Many times</i>).
CONCERNS ABOUT LIFE AND FAMILY DISRUPTIONS	L	Life and Family Concerns	During deployment, I was concerned about... ...the effect of the deployment on my relationship with my spouse or significant other. ...the safety and well-being of my child(ren). ...losing my civilian job because of the deployment.	4-point Likert response format (1 = <i>Not at all</i> ; 4 = <i>A great deal</i>) with an additional option of 0 = <i>Not applicable</i> .
FAMILY STRESSORS	M	Family Events	During deployment... ...a family member or other loved one passed away. ...my relationship with a spouse or significant other ended. ...a family member got into trouble at home, at school, or in the community.	Dichotomous items (0 = <i>No</i> ; 1 = <i>Yes</i>).
Postdeployment Factors				
POSTDEPLOYMENT STRESSORS	N	Postdeployment Life Events	Since returning... ...I was robbed or had my home broken into. ...I had problems getting access to adequate healthcare. ...I lost my job or had serious trouble finding a job.	Dichotomous items (0 = <i>No</i> ; 1 = <i>Yes</i>).
POSTDEPLOYMENT SOCIAL SUPPORT	O	Postdeployment Support	Since returning... ...my family members and/or friends make me feel better when I am down. ...I can go to family members or friends when I need good advice. ...when I am ill, family members or friends will help out until I am well.	5-point Likert response format (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i>).
POSTDEPLOYMENT FAMILY FUNCTIONING	P	Postdeployment Family Experiences	Since returning... ...I feel like I fit in with my family. ...family members know what I think and how I feel about things. ...I get along well with my family members.	5-point Likert response format (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i>).

Potential Uses

The scales contained in the DRRI-2 may be considered as “stand-alone” instruments. One or more of the scales may be selected from the full DRRI-2, depending on the purpose of the study or research question. The measures are intended to address deployment-related factors that either put military Servicemembers or Veterans at risk for postdeployment symptomatology or that serve a protective function. Information generated from the administration of DRRI-2 scales can facilitate a better understanding of the special training and preparedness needs of personnel facing the challenges presented by modern military operations. To the extent that we have a sound understanding of the risk and resilience factors that underlie health-related sequelae of military deployments, we are better able to formulate techniques aimed at stress inoculation. From a postdeployment and/or postmilitary perspective, the use of the DRRI-2 can contribute to a better understanding of Veterans’ health and well-being. Postdeployment physical and mental health and quality of life (including social adjustment and occupational attainment) will surely benefit from scientific research that identifies and measures salient military experiences and their long-term consequences.

Part Two: Administration and Scoring

Instructions and Administration Guidelines

The instructions for the full Deployment Risk and Resilience Inventory-2 (DRRI-2), located on the cover of the instrument, present the general purpose of the inventory by indicating that the "...survey contains questions regarding your experiences before, during, and after military deployment." Each section of the inventory, in turn, contains more specific instructions that orient the respondent to the timeframe (i.e., predeployment, during deployment, postdeployment) and the particular content domain (e.g., predeployment family experiences, combat experiences, postdeployment support) being assessed. Given that it is not unusual for military personnel to experience multiple deployments, instructions are referenced to the respondent's most recent deployment experience. Throughout the inventory, the respondent is requested to mark the option (e.g., *yes* or *no*; 1, 2, 3, 4, or 5 on a Likert response format) that best describes his/her experiences, perceptions, or beliefs. **As noted previously, the scales represented in each section may be extracted and are available as separate entities.**

Please note that we do not recommend including the scale titles in the actual survey instrument, as these titles may prime individuals to respond in a biased manner (e.g., using the title "sexual harassment" may lead to underreporting of experiences that are not perceived as meeting the respondent's interpretation of what constitutes sexual harassment). **Instead, we recommend that investigators include the labels (as presented in Table 1, under "DRRI-2 Label") on the survey instrument and use scale titles (as presented in Table 1, under "Scale") for the purpose of broader communication in the scientific literature (i.e., publications and presentations).** Respondents should be given adequate time to complete the DRRI-2 at a comfortable pace. If administered in its entirety (all 17 scales), the DRRI-2 should take approximately 30 to 40 minutes to complete. The time required to complete the individual scales ranges from approximately 1-2 minutes (e.g., *sexual harassment and deployment support from family and friends*) to 2-3 minutes (e.g., *prior stressors and combat experiences*).

Due to the sensitive nature of some of the items contained in the DRRI-2, respondents should be allowed to complete the instrument anonymously if circumstances permit. Otherwise, the test administrator should make every attempt to ensure respondent privacy and confidentiality.

The reading level of the instrument (instructions and items), as assessed by the Flesch-Kincaid index (Flesch, 1946, 1949), is grade level 8.0 across all scales. Therefore, the instrument should be suitable for the majority of military personnel and Veterans.

Scoring

Recommended guidelines for scoring the DRRI-2 scales are provided in Table 2.

Table 2
DRRI-2 Scoring Guide

Scale	Scoring Instructions
PRIOR STRESSORS [Section A: Predeployment Life Events]	<ul style="list-style-type: none">• Dichotomous items (0 = <i>No</i>; 1 = <i>Yes</i>).• Sum item scores.• The possible range is 0 to 18; higher scores are indicative of more exposure to predeployment stressors.
CHILDHOOD FAMILY FUNCTIONING [Section B: Childhood Family Experiences]	<ul style="list-style-type: none">• 5-point Likert response format (1 = <i>Strongly disagree</i>; 5 = <i>Strongly agree</i>).• Sum item scores.• Possible range is 12 to 60; higher scores are indicative of more positive family functioning before deployment.

Scale	Scoring Instructions
<p>DIFFICULT LIVING AND WORKING ENVIRONMENT</p> <p>[Section C: Deployment Environment]</p>	<ul style="list-style-type: none"> • 5-point Likert response format (1 = <i>Almost none of the time</i>; 5 = <i>Almost all of the time</i>). • Sum item scores. • Possible range is 14 to 70; higher scores are indicative of a more difficult living and working environment.
<p>COMBAT EXPERIENCES</p> <p>[Section D: Combat Experiences]</p>	<ul style="list-style-type: none"> • 6-point Likert response format (1 = <i>Never</i>; 6 = <i>Daily or almost daily</i>). • Sum item scores. • Possible range is 17 to 102; higher scores are indicative of greater exposure to combat.
<p>AFTERMATH OF BATTLE</p> <p>[Section E: Postbattle Experiences]</p>	<ul style="list-style-type: none"> • 6-point Likert response format (1 = <i>Never</i>; 6 = <i>Daily or almost daily</i>). • Sum item scores. • Possible range is 13 to 78; higher scores are indicative of greater exposure to the aftermath of combat.
<p>NBC EXPOSURES</p> <p>[Section F: Exposure to Nuclear, Biological, or Chemical Agents]</p>	<ul style="list-style-type: none"> • Polytomous Items (0 = <i>No</i>; 1 = <i>Not sure</i>; 2 = <i>Yes</i>). • Sum item scores. • Possible range is 0 to 26; higher scores are indicative of greater perceived NBC exposure.
<p>PERCEIVED THREAT</p> <p>[Section G: Deployment Concerns]</p>	<ul style="list-style-type: none"> • 5-point Likert response format (1 = <i>Strongly disagree</i>; 5 = <i>Strongly agree</i>). • Sum item scores. • Possible range is 12 to 60; higher scores are indicative of more perceived threat.
<p>PREPAREDNESS</p> <p>[Section H: Training and Deployment Preparation]</p>	<ul style="list-style-type: none"> • 5-point Likert response format (1 = <i>Strongly disagree</i>; 5 = <i>Strongly agree</i>). • Sum item scores. • Possible range is 10 to 50; higher scores are indicative of a stronger sense of preparedness.
<p>DEPLOYMENT SUPPORT FROM FAMILY AND FRIENDS</p> <p>[Section I: Support from Family/Friends]</p>	<ul style="list-style-type: none"> • 5-point Likert response format (1 = <i>Strongly disagree</i>; 5 = <i>Strongly agree</i>). • Sum item scores. • Possible range is 8 to 40; higher scores are indicative of greater perceived social support from family and friends during deployment.
<p>UNIT SOCIAL SUPPORT</p> <p>[Section J: Unit Support]</p>	<ul style="list-style-type: none"> • 5-point Likert response format (1 = <i>Strongly disagree</i>; 5 = <i>Strongly agree</i>). • Sum item scores. • Possible range is 12 to 60; higher scores are indicative of greater perceived social support from fellow unit members and unit leaders.
<p>GENERAL HARASSMENT</p> <p>[Section K-1: Relationships During Deployment; Items 1-8]</p>	<ul style="list-style-type: none"> • 4-point Likert response format (0 = <i>Never</i>; 3 = <i>Many times</i>). • Sum item scores. • Possible range is 0 to 24; higher scores are indicative of more exposure to general harassment.
<p>SEXUAL HARASSMENT</p> <p>[Section K-2: Relationships During Deployment; Items 9-16]</p>	<ul style="list-style-type: none"> • 4-point Likert response format (0 = <i>Never</i>; 3 = <i>Many times</i>). • Sum item scores. • Possible range is 0 to 24; higher scores are indicative of more exposure to sexual harassment.
<p>CONCERNS ABOUT LIFE AND FAMILY DISRUPTIONS</p> <p>[Section L: Life and Family Concerns]</p>	<ul style="list-style-type: none"> • 4-point Likert response format (1 = <i>Not at all</i>; 4 = <i>A great deal</i>) with an additional option of 0 = <i>Not applicable</i>. • Recode all responses of 0 = <i>Not applicable</i> to a score of 1. • Sum item scores. • Possible range is 15 to 60; higher scores are indicative of more concerns about life and family disruptions.

Scale	Scoring Instructions
<p>FAMILY STRESSORS</p> <p>[Section M: Family Events]</p>	<ul style="list-style-type: none"> • Dichotomous items (0 = <i>No</i>; 1 = <i>Yes</i>). • Sum item scores. • Possible range is 0 to 14; higher scores are indicative of more exposure to family stressors during deployment.
<p>POSTDEPLOYMENT STRESSORS</p> <p>[Section N: Postdeployment Life Events]</p>	<ul style="list-style-type: none"> • Dichotomous items (0 = <i>No</i>; 1 = <i>Yes</i>). • Sum item scores. • Possible range is 0 to 14; higher scores are indicative of more exposure to additional life stressors after deployment.
<p>POSTDEPLOYMENT SOCIAL SUPPORT</p> <p>[Section O: Postdeployment Support]</p>	<ul style="list-style-type: none"> • 5-point Likert response format (1 = <i>Strongly disagree</i>; 5 = <i>Strongly agree</i>). • Sum item scores. • Possible range is 10 to 50; higher scores are indicative of greater perceived social support upon return from deployment.
<p>POSTDEPLOYMENT FAMILY FUNCTIONING</p> <p>[Section P: Postdeployment Family Experiences]</p>	<ul style="list-style-type: none"> • 5-point Likert response format (1 = <i>Strongly disagree</i>; 5 = <i>Strongly agree</i>). • Sum item scores. • Possible range is 12 to 60; higher scores are indicative of more positive family functioning after deployment.

Part Three: Instrument Development and Psychometric Properties

The DRRI-2 is the result of a multi-year psychometric endeavor that involved the application of both classical test theory (CTT) and item response theory (IRT) analytical strategies. This project included three key phases: (a) an initial assessment of the content validity of DRRI scales based on a comprehensive literature review and focus groups with OEF/OIF Veterans, followed by revision of existing DRRI items and development of new items as needed (Phase I); (b) national mail survey of male and female OEF/OIF Veterans to assess the initial item and scale characteristics of proposed DRRI-2 scales as they compare to original DRRI scales (Phase II); and (c) administration of refined DRRI-2 scales to a second national sample of OEF/OIF Veterans to confirm the psychometric quality of finalized DRRI-2 scales (Phase III). Each phase of this project is described in more detail in the following section.

Phase I: Focus Groups to Inform DRRI-2 Item and Scale Development

Phase I began with an initial assessment of the content validity of the original DRRI scales based on a comprehensive literature review. We surveyed the relevant literature to identify potential areas for expansion, reviewing other measures of deployment-related constructs, as well as the results of studies of deployment-related factors and their impact on postdeployment health. We then conducted focus groups with a diverse sample of OEF/OIF Veterans that included both men and women Veterans deployed from Active Duty and National Guard/Reserves and representation from all branches of service. One aim was to identify additional risk and resilience domains of relevance for this cohort. With a focus group methodology, participants respond not only to the moderator's questions but also to each other's comments, yielding a rich and potentially more complete discussion than is allowed in individual interviews (Vogt, King, & King, 2004).

A total of 21 returned OEF/OIF Veterans participated in one of four focus groups. A partial transcript was developed and coded by the research team for themes of deployment-related risk and resilience. Next, information gathered from the focus groups was used to update the DRRI. Specifically, a number of new items were developed, and existing items were revised to enhance clarity. In addition, items that were deemed to be less relevant for contemporary Veterans (e.g., items highly specific to deployment to the first Gulf War) were eliminated or rewritten to be more broadly relevant across Veteran cohorts. Furthermore, based on information obtained in focus groups, several new scales were developed to address additional content domains (i.e., *deployment support from family and friends*, *family stressors*, and *postdeployment family functioning*)².

Items were reviewed and refined according to six specifications: readability, item-to-scale match, face validity, neutrality, "double barreledness," and response variance. All new and revised items were then reviewed by content and instrument development experts and were revised according to their input. Finally, following recommendations for enhancing content validity (Haynes, Richard, & Kubany, 1995), updated and new DRRI scales were reviewed by a small sample of the target population (N = 9 Veterans). These judges read, reviewed, and provided feedback on existing and newly revised items, which prompted further refinement and revision.

Phase II: Initial Examination of Item and Scale Characteristics in a National Sample of OEF/OIF Veterans

In Phase II, original and revised DRRI items were administered to a national sample of 469 OEF/OIF Veterans (59% female, 41% male) identified from a Department of Defense roster of all OEF/OIF Veterans. During their most recent deployment, 70% of participants served in support of OIF and 30% served in support of OEF. Table 3 contains additional demographic and military characteristics for the Phase II sample.

Using a modification of the Dillman (2009) mail survey procedure, the study questionnaire was sent to potential participants in repeated mailings via standard U.S. mail. Specifically, consistent with the recommendation for repeated

² Please note that several additional potential DRRI-2 scales were developed during Phase I, but ultimately were not retained, as they were determined to not add sufficient psychometric value when tested during Phase II.

contacts with targeted respondents (Dillman, 2009), the first mailing included a copy of the study questionnaire, an opt-out form participants could return to indicate that they did not want to be contacted again, and a gift card as a token of appreciation. A reminder/thank-you postcard was mailed two weeks after the first survey mailing. Potential participants who did not respond to the first mailing were sent a second mailing of the assessment package, followed by a second reminder/thank-you postcard two weeks later. Finally, non-responders were sent a final mailing of the assessment package five weeks following the previous contact, followed by a final reminder/thank you card.

In addition to demographic and military characteristics, the questionnaire included items assessing revised and newly developed DRRI scales, as well as all DRRI items from the original suite of 14 measures (King, King, & Vogt, 2003), to allow for comparisons between the new/modified and original scales. To assess the criterion-related validity of the proposed DRRI-2 scales, the military version of the 17-item PTSD Checklist (Weathers et al., 1993; Blanchard et al., 1996) was also included as an indicator of PTSD symptom severity.

Both CTT- (e.g., Aiken, 1994; Anastasi, 1982; Nunnally, 1978) and IRT- (e.g., de Ayala, 2009; Embretson & Hershberger, 1999; Reeve et al., 2007) oriented item and scale characteristics were computed. For items that were accompanied by multipoint Likert-type response formats (e.g., *Strongly disagree* to *Strongly agree*), frequency distributions and descriptive statistics were calculated. For dichotomous items, (e.g., *Yes/No* responses), probabilities of endorsement, or the proportion of respondents providing an affirmative response, were calculated. Corrected item-total correlations, the correlations of each item's score with the sum of scores on all other items within a scale, were also computed. IRT-based analyses were conducted to assess the construct coverage of the DRRI scales, and to inform further item and measure refinements. IRT models were fit to the data for each of the proposed DRRI-2 scales that represented traditional latent constructs using the graded response IRT model in Parscale 4.1 (Muraki & Bock, 2003). Discrimination and difficulty parameters and fit indices were examined for each item, and item-person maps were used to assess construct coverage.

Several guidelines were applied to identify final items sets for the proposed DRRI-2 at this stage of development. Items that had a symmetric response distribution were preferred over items that had a skewed distribution. In general, items with higher item-total correlations took precedence over those with lower item-total correlations. For certain constructs, however, especially those based on discrete stressor events that are not necessarily expected to covary (e.g., being in an automobile accident and being assaulted), content relevance and content breadth were considered more critical to item retention than the item-total correlation. Items that demonstrated poor fit or other undesirable item qualities (e.g., problematic difficulty parameters in the context of the larger scale) in IRT analyses were considered as candidates for deletion or revision. To meet our goal of providing more efficient (i.e., shorter) scales, items that demonstrated overlap in construct coverage were also considered for deletion when eliminating them would not compromise content integrity.

Overall, results supported the psychometric quality of the initially developed set of DRRI-2 scales. Specifically, evidence was provided for the internal consistency reliability of proposed DRRI-2 scales, as appropriate, and expected associations were observed between these scales and a measure of PTSD symptom severity, providing support for criterion-related validity. Importantly, estimates of internal consistency reliability and criterion-related validity were slightly higher than that observed for the original DRRI scales despite the overall reduction in measure length. However, IRT analyses pointed to the need for further revision to better capture the full construct continuum for several scales. Therefore, new items were developed to target gaps in construct coverage, and updated DRRI-2 scales were administered in the next and final step in the DRRI-2 development process (Phase III).

Table 3*Demographics and Respondent Characteristics for the Phase II and Phase III Mail Surveys*

Variable	Frequency			
	Phase II n	Phase II %	Phase III n	Phase III %
Gender				
Female	275	59	554	53
Male	190	41	482	47
Age Group				
20-30	220	48	477	46
31-40	103	22	252	24
41-50	87	19	199	19
51-60	41	9	59	6
>60	12	2	45	4
Hispanic Ethnicity				
Hispanic	55	12	124	12
Non-Hispanic	406	88	902	88
Race				
Pacific Islander	6	1	19	2
American Indian/Alaskan Native	12	3	37	4
Asian	16	3	42	4
Black or African American	74	16	142	14
White	341	73	781	75
Other	22	5	61	6
Branch of Military				
Marines	31	7	73	7
Army	311	67	667	65
Navy	57	12	159	15
Air Force	65	14	132	13
Coast Guard	0	0	3	0
Type of Duty				
Active Duty	246	53	585	57
National Guard	122	27	263	25
Reserves	93	20	179	17

Note: Percentages do not always total 100 due to rounding.

Phase III: Final Development of DRRI-2 Scales, Confirmation of Item and Scale Characteristics, and Examination of Evidence for Validity in a National Sample of OEF/OIF Veterans

Phase III involved administering a revised set of scales to a second national sample of 1,046 OEF/OIF Veterans (53% female, 47% male). During their most recent deployment, 66% of participants served in support of OIF and 34% served in support of OEF. Additional demographic information on this sample can be found in Table 3.

Phase III applied the same mail survey methodology that was employed in Phase II. In addition to items assessing demographic and military characteristics and all of the proposed DRRI-2 scales, the questionnaire included several measures to examine the criterion-related validity of the DRRI-2. These included the 17-item PTSD Checklist (Weathers et al., 1993; Blanchard et al., 1996) to assess PTSD symptom severity and adapted versions of the 7-item Beck Depression Inventory – Primary Care (Beck, Steer, Ball, Ciervo, & Kabat, 1997) and 7-item Beck Anxiety Inventory – Primary Care (Beck et al., 1997) to assess depression and anxiety symptom severity, respectively.

CTT-oriented item and scale characteristics were once again computed (Aiken, 1994; Anastasi, 1982; Nunnally, 1978). More specifically, frequency distributions, descriptive statistics (including means, standard deviations, and ranges), the probabilities of endorsement, and corrected item-total correlations were calculated for each item, as appropriate. Estimates of internal consistency reliability were derived for all DRRI-2 scales. IRT-based analyses were also conducted, with a primary focus on assessing construct coverage for the measures and identifying items that could be removed without damaging psychometric quality or content coverage. Based on these analyses, final item sets were identified for the DRRI-2.

Results

Descriptive statistics and associations between DRRI-2 scales and mental health. Table 4 presents psychometric information for the finalized DRRI-2 scales, including number of items, mean, standard deviation, range, and internal consistency reliability for each measure.

CTT analyses confirmed that the scales show high internal consistency reliability. Specifically, alphas for the scales for which high internal consistency would be expected (i.e., those that represented traditional latent variables) averaged .93, well above the minimum recommended alpha of .80 (Nunnally, 1978). None of the scales that assessed composite stressor variables were expected to yield high internal consistency reliability scores, as they are based on discrete events that are not necessarily expected to covary. In fact, the only four scales that had the lower internal consistency estimates (alphas in the .70 - .80 range) do indeed reference composite stressor variables (*prior stressors*, *NBC exposures*, *family stressors*, and *postdeployment stressors*). DRRI-2 scales also showed reasonable dispersion, suggesting that there were no substantial problems with either ceiling or floor effects. IRT analyses indicated that the items discriminate sufficiently among individuals at varying levels of the latent traits, with greatest precision at levels believed to be most predictive of postdeployment functioning and mental health.

Table 4

Psychometric Characteristics for Final DRRI-2 Scales (Phase III)

DRRI-2 Scales	No. of Items	Mean	SD	Range	Alpha
Prior Stressors	18	2.49	2.81	0-17	.79
Childhood Family Functioning	12	42.96	12.07	12-60	.95
Difficult Living and Working Environment	14	34.31	10.47	14-70	.90
Combat Experiences	17	25.66	11.60	17-85	.91
Aftermath of Battle	13	24.09	12.37	13-78	.92
NBC Exposures	13	11.16	4.96	0-25	.80
Perceived Threat	12	32.39	11.62	12-60	.91
Preparedness	10	35.45	9.41	10-50	.91
Deployment Support from Family and Friends	8	33.76	6.94	8-40	.92
Unit Social Support	12	41.10	13.53	12-60	.96
General Harassment	8	6.74	6.51	0-24	.93
Sexual Harassment	8	1.20	3.06	0-23	.86
Concerns About Life and Family Disruptions	15	29.56	10.08	15-60	.89
Family Stressors	14	2.86	2.74	0-14	.76
Postdeployment Stressors	14	2.57	2.34	0-12	.70
Postdeployment Social Support	10	40.08	8.14	10-50	.90
Postdeployment Family Functioning	12	47.57	11.49	12-60	.96

Note: High internal consistency reliability is not expected for the composite variables (i.e., Prior Stressors, Combat Experiences, Aftermath of Battle, NBC Exposures, General Harassment, Sexual Harassment, Family Stressors, and Postdeployment Stressors).

Table 5 presents the correlations between each DRRI-2 scale and PTSD, depression, and anxiety symptom severity, with associations supporting the criterion-related validity of the DRRI-2. The mean association with PTSD symptom severity, the primary criterion, was .39, and all correlations were significant at the .01 level. Overall, the measures demonstrated moderate to strong relationships with PTSD symptom severity, with correlations ranging from -.15 (*childhood family functioning*) to .56 (*difficult living and working environment, perceived threat, and postdeployment stressors*). All of the DRRI-2 scales also demonstrated significant associations with depression symptom severity and anxiety symptom severity, with associations ranging from .20 (*combat experiences*) to .50 (*postdeployment stressors*) for the former, and from .22 (*childhood family functioning, aftermath of battle*) to .51 (*postdeployment stressors*) for the latter. Moreover, an examination of incremental validity revealed that the new DRRI-2 scales added unique variance in the prediction of PTSD symptom severity above and beyond existing DRRI-2 scales, indicating that the inclusion of these new measures provide for a more comprehensive assessment of deployment-related risk and resilience.

Table 5

Bivariate Correlations between Finalized DRRI-2 Scales and PTSD, Depression, and Anxiety Symptom Severity (Phase III)

DRRI-2 Scales	PTSD	Depression	Anxiety
1. Prior Stressors	.33	.28	.31
2. Childhood Family Functioning	-.15	-.25	-.22
3. Difficult Living and Working Environment	.56	.31	.38
4. Combat Experiences	.45	.20	.23
5. Aftermath of Battle	.43	.22	.22
6. NBC Exposures	.40	.24	.28
7. Perceived Threat	.55	.33	.46
8. Personal Preparedness	-.28	-.27	-.26
9. Deployment Support from Family and Friends	-.35	-.35	-.33
10. Deployment Unit Social Support	-.27	-.28	-.24
11. General Harassment	.36	.32	.31
12. Sexual Harassment	.32	.26	.28
13. Concerns About Life and Family Disruptions	.31	.25	.27
14. Family Stressors During Deployment	.40	.34	.39
15. Postdeployment Stressors	.55	.50	.51
16. Postdeployment Social Support	-.46	-.44	-.41
17. Postdeployment Family Functioning	-.42	-.45	-.43

Note: All correlations significant at $p < .001$

Group Differences. The discriminative validity of the DRRI-2 was assessed by examining group comparisons to determine whether expected differences in responding to DRRI-2 scales were found for gender and deployment component (comparing those deployed from Active Duty to those deployed from National Guard/Reserves).

Table 6 presents the results of comparisons on all scales between men and women. As expected based on the fact that men are more likely to serve in combat arms roles than women, men were more likely to report exposure to mission-related stressors, including *difficult living and working environment, combat experiences, aftermath of battle, and perceived threat*. Men were also more likely to report higher levels of *preparedness, unit social support, and concerns about life and family disruptions*, whereas women reported more exposure to *general and sexual harassment*.

Table 6
Comparisons between Men and Women

DRRI-2 Scales	Women <i>M</i>	Women <i>SD</i>	Men <i>M</i>	Men <i>SD</i>	<i>t</i>
1. Prior Stressors	2.49	2.81	2.47	2.77	-0.08
2. Childhood Family Functioning	42.67	12.52	43.43	11.33	0.99
3. Difficult Living and Working Environment	32.42	9.79	36.49	10.81	6.24*
4. Combat Experiences	22.22	7.43	29.71	14.03	10.62*
5. Aftermath of Battle	21.47	11.15	26.97	13.01	7.17*
6. NBC Exposures	10.39	4.93	12.04	4.85	5.32*
7. Perceived Threat	31.43	11.77	33.44	11.33	2.76*
8. Personal Preparedness	34.71	9.33	36.24	9.46	2.59*
9. Deployment Support from Family and Friends	33.59	7.08	33.96	6.80	0.85
10. Deployment Unit Social Support	38.59	14.07	44.04	12.19	6.53*
11. General Harassment	7.87	7.01	5.47	5.66	-5.91*
12. Sexual Harassment	1.99	3.92	0.30	1.12	-9.07*
13. Concerns About Life and Family Disruptions	28.31	9.62	30.96	10.38	4.20*
14. Family Stressors During Deployment	2.91	2.62	2.74	2.76	-1.06
15. Postdeployment Stressors	2.62	2.30	2.49	2.34	-0.92
16. Postdeployment Social Support	39.98	8.23	40.22	8.06	0.47
17. Postdeployment Family Functioning	47.54	11.72	47.65	11.19	0.15

* $p < .05$

Table 7 presents comparisons between those deployed from Active Duty and those deployed from National Guard/Reserves. Consistent with prior research based on Gulf War Veterans, Active Duty personnel generally reported more stressors (*combat experiences, aftermath of battle, and postdeployment stressors*) than National Guard/Reserves. National Guard/Reserves reported lower levels of *preparedness*, and higher levels of *childhood family functioning and postdeployment family functioning* than those deployed from Active Duty.

Table 7
Comparisons between Active Duty and National Guard/Reserves

DRRI-2 Scales	Active Duty <i>M</i>	Active Duty <i>SD</i>	National Guard/ Reserves <i>M</i>	National Guard/ Reserves <i>SD</i>	<i>t</i>
1. Prior Stressors	2.59	2.85	2.32	2.74	1.51
2. Childhood Family Functioning	42.18	12.46	44.16	11.36	-2.56*
3. Difficult Living and Working Environment	34.67	10.88	33.89	9.87	1.16
4. Combat Experiences	26.39	12.89	24.61	9.46	2.36*
5. Aftermath of Battle	24.82	13.36	22.91	10.85	2.40*
6. NBC Exposures	11.04	5.10	11.29	4.76	-0.79
7. Perceived Threat	32.47	11.96	32.32	11.21	0.19
8. Personal Preparedness	36.06	9.37	34.58	9.42	2.47*
9. Deployment Support from Family and Friends	33.49	6.94	34.08	7.00	-1.33
10. Deployment Unit Social Support	41.70	13.36	40.22	13.78	1.71
11. General Harassment	6.75	6.62	6.76	6.44	-0.04
12. Sexual Harassment	1.23	3.10	1.19	3.06	0.19
13. Concerns About Life and Family Disruptions	29.49	10.29	29.50	9.74	-0.01
14. Family Stressors During Deployment	2.93	2.80	2.68	2.53	1.46
15. Postdeployment Stressors	2.70	2.45	2.38	2.13	2.15*
16. Postdeployment Social Support	39.61	8.11	40.64	8.18	-1.98
17. Postdeployment Family Functioning	46.78	11.80	48.52	11.08	-2.38*

* $p < 0.5$

Summary

The DRRI-2 is a psychometrically sound, yet efficient, suite of 17 scales that addresses deployment-related factors that are associated with the postdeployment health and well-being of military Veterans. Any one or more of these scales may be used separately, or the entire DRRI-2 can be administered as a package to survey key predeployment, deployment, and postdeployment factors that put Veterans at risk for, or protect against, negative health consequences of deployment. The development of the DRRI-2 was informed by a careful consideration of content validity, with input from members of the target population at two stages of the development process (both focus groups to inform initial item content and cognitive interviews to refine item content). A multi-phase investigation of the psychometric properties of updated DRRI-2 scales provided encouraging evidence for the reliability and validity of these measures. Specifically, DRRI-2 scales that were expected to demonstrate high levels of internal consistency reliability did so, and all scales were associated with important mental health outcomes, providing evidence for criterion-related validity. In addition, evidence was provided for the incremental validity of newly developed DRRI-2 scales relative to existing but revised scales. Evidence was also provided for the discriminative validity of the DRRI-2, vis-a-vis the ability to discriminate between Veteran subgroups. Finally, as compared to the original DRRI, the DRRI-2 scales are 15% shorter, on average. It is our hope that these measures will be used to further knowledge of the role that risk and resilience factors play in Veterans' postdeployment health and inform interventions aimed at reducing risk and enhancing resilience within these populations.

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