

# Measurement of Veteran's Participation



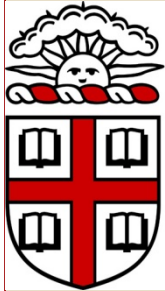
Linda Resnik, PT, PhD

## **MEASURING PARTICIPATION OUTCOMES**

ASHA Annual Meeting

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BROWN



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# Objectives



- Describe the construct of participation
- Discuss key issues in measurement of participation
- Provide background information on the need for a measure of participation for Veterans
- Describe the process of development and testing of the CRIS measure
- Describe the process of development and testing of a computer adaptive test version, the CRIS-CAT

# Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF)



**Veterans have a high prevalence of:**

- Traumatic brain injury (TBI)
- Posttraumatic Stress Disorder (PTSD)
- Depression
- Polytraumatic injuries

# OEF/OIF Veterans



- **Demobilization and returning home from combat can be challenging**
- **Community reintegration may be complicated by the co-occurrence of physical injuries with postwar mental health difficulties**

# Community Reintegration

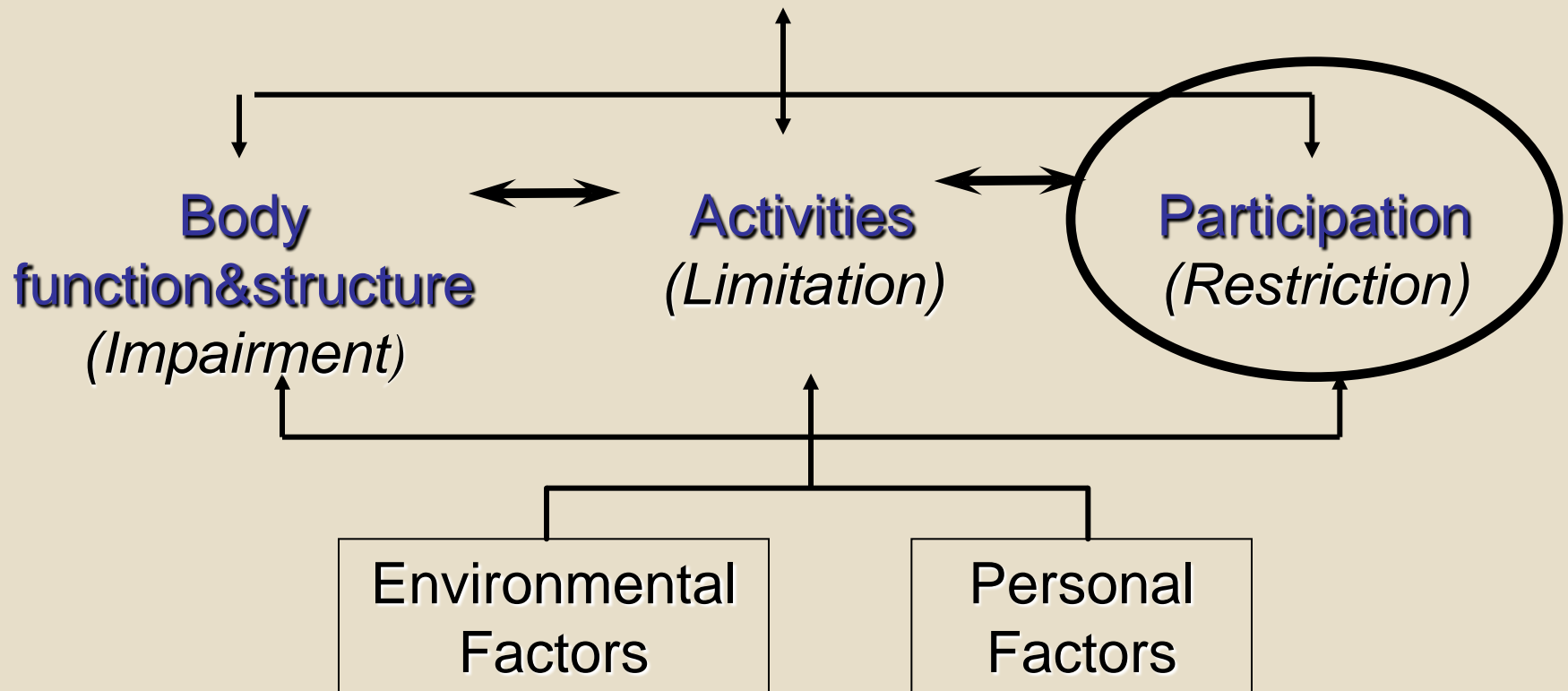


- Community reintegration is the return of individuals to their age, gender and culturally appropriate roles at as near as possible to their pre-injury level of **participation**
- Participation is the outcome most valued by individuals with disabilities, their family members, and society
- How can we assess community reintegration?

# ICF Model of Functioning, Disability & Health



Health Condition  
(disorder/disease)



# ICF Definition of Participation



- Participation is involvement in a life situation
- Participation restrictions are problems an individual may experience in involvement in life situations





# Activities and Participation Share the Same ICF Taxonomy

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## ◎ Chapters of Activities and Participation

1. Learning and Applying Knowledge
2. General Tasks and Demands
3. Communication
4. Mobility
5. Domestic Life
6. Self Care
7. Interpersonal Relationships
8. Major Life Areas
9. Community, Social and Civic

# The CRIS

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- Decision to develop a new Participation measure for Veterans: The Community Reintegration of Service Members measure (the CRIS)
- In our development work we grappled with many of the issues in conceptualizing and measuring Participation that have since been well described in the literature

# Distinguishing Between Activities and Participation



## Annex 3 of the ICF

1. Exclusively designate some of the 9 domains as *activities* and others as *participation*
  - *Whiteneck and Dijkers, 2009*
2. Designate some domains as *activities* and others as *participation* - allowing partial overlap
3. Designate all broad categories as *participation* and all detailed categories as *activities*
4. Consider all codes as both *activities* and *participation*, depending upon the content
  - ✦ Simple tasks and actions = *activities*
    - Complex functional tasks and actions = *participation*

# Who Defines Participation?

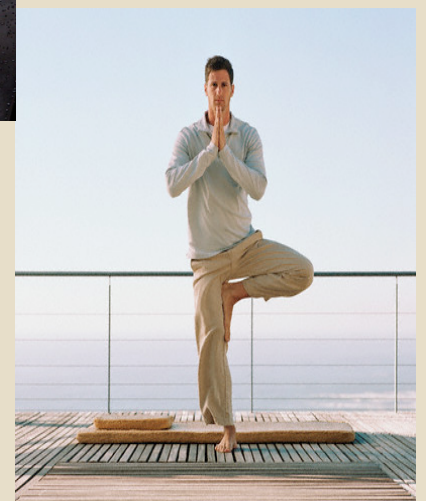


- **The ICF**
  - Each Chapter has multiple sub-levels
    - Need to identify critical elements for data collection
    - Important elements may vary by condition, population
      - Development of ICF core sets for common conditions
  
- **Whiteneck and Dijkers recommend 3 areas be included in a taxonomy of participation**
  - Social participation and relationships (Interpersonal Relationships)
  - Productivity and economic participation (Major Life Areas)
  - Leisure/recreational participation (Community, Social and Civic)

# Involvement in Life Situations



- Participation CAN and DOES occur at the person-level
- Adult role functions
  - ✦ Engaging in hobbies
  - ✦ Planning, cooking meals
  - ✦ Managing daily schedule
  - ✦ Taking care of health
  - ✦ Managing stress
  - ✦ Maintaining hygiene and appearance
  - ✦ Planning a trip
  - ✦ Following complex directions
  - ✦ Obeying the “rules of the road” while driving



# Measurement of Social Function



- This approach contrasts with the view that role performance at the social level and that social roles are, by definition, done with other people
- Contrasts with the approach taken in development of the PROMIS social health measure
  - Social function
    - ✦ Involvement in and satisfaction with usual social roles in life situations and activities

# Aspects of Participation



- **Performance**
  - The degree to which individuals take part in social roles
  - Frequency
- **Limitation, difficulty, restriction**
- **Satisfaction**
- **Importance**
- **Autonomy**
- **Participation enfranchisement**

# Other Issues in Measurement



- **Unidimensional or multidimensional and hierarchical latent trait?**
  - Assumption: items are indicators of a latent trait
    - ✦ Psychometric (CTT, or IRT) approach
- **Multidimensional trait**
  - Items are causal indicators, thus not necessarily correlated
    - ✦ Clinimetric approach



# Development of the CRIS Measure

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**VA HSR&D VA TRP-04-1**  
**VA RI FOUNDATION 2005-2665**  
**VA HSR&D VA SDR-07-327**  
**VA HSR&D DHI-144-07**  
**BOSTON UNIVERSITY R-24 (JETTE)**

Formative Research



Development of CRIS Item Set



Revision of Item Set



Development of Fixed Form Measure



Development of CAT: Field study with 1 year follow-up



Testing Fixed Form in Severely wounded sample



Mode of Administration study



Development of audio-assisted CAT software



Testing in mTBI Sample

# Formative Research



- 1) Utilized the ICF framework to understand the challenges to community reintegration of injured service members
- 2) Designed and tested a new measure of community reintegration of injured service members, called the CRIS

# Approach



1. Developed a population-specific participation measure relevant to combat Veterans
2. Formative research to understand participation and common participation restrictions
3. Used the ICF taxonomy to identify participation items
  - Employed the ICF Annex Approach #4
  - Considered all codes as both activities and participation, depending upon the content
    - Simple tasks and actions =activities
    - Complex functional tasks and actions =*participation*
4. Included objective, subjective and satisfaction aspects of participation

# The Challenge



- 2004: A measure of Veteran Participation is needed, given the impact of combat deployment on returning Service members

➤ No measure that addressed key concerns of returning Veterans



# Data Collection



- **In-depth interviews**
- **Interviews of service members and caregivers**
  - audiotaped and transcribed
- **Interviews with health care providers**
  - detailed memos

# Data Analysis



- Issues identified classified into one or more domains Activities/Participation
- Further classified into one or more subcategories of each domains when possible
- Two coders independently coded each transcript and reached agreement on classification at each level

# Data Analysis



- Concerns identified in the interviews were matched to the items from existing measures.
- Over 20 other measures were reviewed. Every item from every measure was coded.



# Findings



- Existing measures lacked questions about the type of participation difficulties experienced by injured service members. For example, most lacked questions regarding:
  - Attention and concentration (learning and applying knowledge)
  - Coping and stress management (general tasks and demands)
  - Driving (mobility)
  - Alcohol and drug use (self-care)
  - Social isolation, tolerance, intimacy and sexual function (interpersonal relationships)
  - Maintaining a job (major life areas)

# Learning and Applying Knowledge: Focusing Attention



- He's very unfocused VERY unfocused. For him to read that document you just gave me on Monday that would stress him out. That is going to extremely stress him out to read those 4 pages. Yeah, I can prepare him and say they're going to give you a 4 page document that you need to sign, explain to him what it is. He will lose half of what I'm saying to him by the time I'm done.
  - Caregiver (girlfriend of injured service member)

# Mobility: Driving



- I seen items -- it was just regular garbage.... It seemed like something that was going to possibly cause harm to somebody, and I felt a need to just get away from it, because -- when you get anxiety, you get, like pressure in your chest, and your throat gets all choked up, you have a hard time breathing. I seen it coming. It's like, you hold onto the steering wheel real hard, like I'm waiting for another bomb to go off or something, and then I'd just -- I didn't even look to see if anybody was near me, and I just rammed off to the side and came around it, just to get away from it. And you step on the gas, just speed right by it.
  - ✦ Injured Service Member

# Interpersonal Relationships: Tolerance



- I just have low tolerance for stupid stuff. God, about a month ago I was in McDonald's with a friend of mine and the lady in front of us was just taking forever, and um I was just like, I'm like, 'Christ, lady, it's the same menu in every McDonald's all over the country. Like order something or get out of the way.' And everybody, it was like, you know, everybody in the restaurant just kind of looked at me, and she moved out of the way and we ordered and that was that.
  - ✦ Injured service member

# Interpersonal Relationships: Regulating Behaviors



- When I first got home when I was at Fort Drum, I was there about two months uh.. this kid bumped into me in the local mall and I just started developing an attitude. He wasn't watching where he was going. I laid him out cold.
  - Injured Service Member

# Community Social and Civic: Social isolation



- I used to love going out before. Even if it was just going out to the mall, to look around or something. Now, I go out when I need to, you know. If I go to get say, like food, like Taco Bell or whatever, I won't go inside, I'll go through the drive through. Ah.. my tolerance for dealing with people ... I don't like crowds, it's like I kinda just want to be left alone.

✦ Injured Service Member

# Formative Research

Department of  
Veterans Affairs

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Journal of Rehabilitation Research & Development

## Using International Classification of Functioning, Disability and Health to understand challenges in community reintegration of injured veterans

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**Abstract**—This pilot study used the framework of the World Health Organization's International Classification of Functioning, Disability and Health (ICF) to understand the challenges faced by Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans as they reintegrate into the community. We conducted semistructured interviews with 14 injured veterans, 12 caregivers, and 14 clinicians. We used ICF taxonomy to code data and identify issues. We identified challenges in the following ICF domains: learning and applying knowledge; general tasks and demands; communication; mobility; self-care; domestic life; interpersonal interactions; major life areas; and community, social, and civic life. We found many similarities between the challenges faced by veterans with and without polytraumatic injuries, although veterans with polytraumatic injuries faced challenges of greater magnitude. Identifying community reintegration challenges early and promoting reintegration are important mandates for the Department of Veterans Affairs. The findings of this study are useful in understanding the needs of OEF/OIF veterans.

**Key words:** activities, community reintegration, ICF, International Classification of Functioning, Disability and Health, OEF/OIF, participation, polytrauma, rehabilitation, TBI, veterans.

### INTRODUCTION

More than 1 million U.S. soldiers, sailors, and marines have been deployed in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Redeploying home can be challenging, and many veterans have readjustment issues such as marital difficulties,

financial difficulties, alcohol or substance abuse problems, medical problems, and behavioral problems such as depression or anxiety [1], homelessness [2], and motor vehicle accidents [3]. Readjusting to community living is even more challenging for veterans who sustain deployment-related injuries because it may be complicated by the co-occurrence of physical injuries and postwar adjustment difficulties (posttraumatic stress disorder [PTSD]), depression, substance abuse, and severe mental illness [1,4]. Additionally, because of body armor that protects the torso but not the brain or extremities, many OEF/OIF service members are surviving wounds that may have been fatal in previous wars but are now resulting in multiple and severe injuries [5-6]. The most serious injuries are those considered polytrauma, defined by the Veterans Health Administration as, "injury to the brain [traumatic brain injury] (TBI) in addition to other body parts or systems resulting in physical, cognitive, psychological, or psychosocial impairments and functional disability" [7].

**Abbreviations:** ICF = International Classification of Functioning, Disability and Health, OEF = Operation Enduring Freedom, OIF = Operation Iraqi Freedom, PDA = personal digital assistant, PTSD = posttraumatic stress disorder, TBI = traumatic brain injury, VA = Department of Veterans Affairs, VAMC = VA medical center, WHO = World Health Organization.

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ORIGINAL ARTICLE

## Measuring Participation as Defined by the International Classification of Functioning, Disability and Health: An Evaluation of Existing Measures

Linda Resnik, PT, PhD, OCS, Matthew A. Plow, PhD

**ABSTRACT.** Resnik L, Plow M. Measuring participation as defined by the International Classification of Functioning, Disability and Health: an evaluation of existing measures. Arch Phys Med Rehabil 2009;90:856-66.

**Objectives:** The content and theoretic underpinning of measures designed to assess participation, disability, and handicap vary widely, and few authors have attempted to compare the content of existing measures. The objectives of this study were to use the *International Classification of Functioning, Disability and Health* (ICF) taxonomy to (1) evaluate the participation content of measures and (2) identify the most comprehensive measures.

**Design:** We searched PubMed, Cumulated Index of Nursing and Allied Health Literature, and Health and Psychosocial Instruments databases to identify appropriate measures. Content analysis was conducted by classifying participation-related items of each measure into 1 or more of the 9 activities and participation chapters of the ICF taxonomy.

**Setting:** Not applicable.

**Participants:** We evaluated 40 generic and condition-specific self-report measures that met study inclusion criteria.

**Interventions:** Not applicable.

**Main Outcome Measures:** The most comprehensive measures were identified and coded by using second- and third-level ICF codes.

**Results:** Five measures containing participation items linked to all 9 chapters were the Community Living Skills Scale, the Assessment of Life Habits, Mayo-Portland Adaptability Inventory, the participation measure for postacute care, and the Psychosocial Adjustment to Illness Scale. The breadth and coverage of these 5 measures were compared.

**Conclusions:** We identified 5 measures that had items that were linkable to all 9 chapters of activities and participation; however, these measures differed in specifics of coverage and the approach to assessing participation. These findings can be used by clinicians and researchers to select the most comprehensive participation outcome measure for their populations.

**Key Words:** Disability evaluation; Outcomes assessment (health care); Questionnaires; Rehabilitation.

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THE WORLD HEALTH ORGANIZATION'S ICF model is the most recent and comprehensive model of functioning and disability.<sup>1,2</sup> The overall purpose of the ICF is to provide a standard language and framework for the description of human functioning and its negative notion, disability. The ICF model is divided into 2 components: the first covers functioning and disability, which includes 4 domains: (1) body function, (2) structure, (3) activities, and (4) participation. The second component of the model covers contextual factors including environmental and personal factors.

In the ICF graphic model, the domains of body functions and structure, activities, and participation are distinct from each other. However, in the ICF taxonomy, there is only 1 coding structure for both activity and participation. Nevertheless, the 2 domains are conceptually distinct. The ICF taxonomy for activity and participation includes 9 overall chapter levels that include the following: Learning and Applying Knowledge; General Tasks and Demands; Communication; Mobility; Self-Care; Domestic Life; Interpersonal Relationships; Major Life Areas; and Community, Social, and Civic Life. The ICF taxonomy includes second-, third-, and fourth-level coding within each chapter of the taxonomy with each level of coding becoming increasingly specific.

According to the ICF, activities focus on the person's individual functioning and are more likely to be performed alone.<sup>3</sup> In contrast, participation focuses on the person's involvement in society (ie, social functioning), and participation would more likely be performed with others. However, activities such as eating, thinking, and traveling might be undertaken alone but could arguably be indicators of participation.<sup>4</sup> Thus, there is an ongoing debate in the literature about the domains of participation and activities. This debate is important because participation is the outcome that may be most valued to people with disabilities, their family members, and society.<sup>5</sup> Thus, the measurement of participation outcomes is critical for the fields of physical medicine and rehabilitation. However, the measurement of participation is a relatively new field.<sup>3</sup>

In the ICF taxonomy, the term participation replaces the term disability used in the 1991 and 1997 Institute of Medicine

### List of Abbreviations

ABI	acquired brain injury
ICC	intraclass correlation coefficient
ICF	<i>International Classification of Functioning, Disability and Health</i>
LIFE-H	Assessment of Life Habits
MESH	medical subject heading
MPAI	Mayo-Portland Adaptability Inventory
PAIS	Psychosocial Adjustment to Illness Scale
PAIS-SR	Psychosocial Adjustment to Illness Scale self-report version
OOL	quality of life
TBI	traumatic brain injury

# CRIS Development



- **The CRIS assesses three concepts**
  - ✦ Perceived limitations in participation
  - ✦ Frequency and amount of participation
  - ✦ Satisfaction with level of participation
  
- **The CRIS assesses both objective and subjective aspects of participation as well as satisfaction.**



# CRIS Development



- All questions address current life situation
- No comparison to life before injury, or to other persons without injury or to those who hadn't been deployed
- No attribution to injury or illness

# CRIS Fixed Form Measure



- **3 Scales**
  - Extent of participation (frequency)
  - Perceived limitation in participation
  - Satisfaction with level of participation
- **150 Questions**
  - 30-35 minutes to administer

# Initial Testing of CRIS Validity



- Sample of 50 veterans recruited from the PVAMC
  - Examined dimensionality of scales using IRT
  - Calculated scale internal consistency
  - Examined differences in CRIS scores by:
    - ✦ Employment status
    - ✦ PTSD
    - ✦ Depression
- ANOVAs using the above independent variables and CRIS scales as dependent variables

# Results Pilot 1



- Scales are unidimensional
- Some items don't "fit" and need revision
- Scales have good internal consistency

# Results



- Veterans who were working had better scores as compared to those who were retired or not working
- Veterans with PTSD had worse scores as compared to veterans without PTSD
- Veterans with depression had lower scores on Satisfaction with Participation scale
- The results of these analyses demonstrate good construct validity of CRIS scales

# Misfit Items Revised



- New items written and misfit items were revised
- New questions “cognitively tested”

# Pilot Study 2



- Sample of 75 veterans
- CRIS is administered twice within one week

# Pilot Study 2



- Examined dimensionality of scales using IRT
- Calculated internal consistency of scales: alpha
- Calculated test-retest reliability: ICC
- Tested for differences in CRIS scores between groups



# Results Pilot 2



- Scales are unidimensional
- Scales have excellent internal consistency
- Scales have excellent reliability

# Results



- **Veterans who were working had better scores as compared to those who were not working**
- **Veterans with PTSD had worse scores as compared to veterans without PTSD**
- **Veterans with substance abuse history had worse scores as compared to veterans without**
- **Veterans with any mental illness had worse scores as compared to veterans without**

# Example of CRIS Questions

## Community Social and Civic

### d9205 Socializing

Engaging in informal or casual gatherings with others, such as visiting friends or relatives or meeting informally in public places.

### Perceived limitation

How limited are you in engaging in social gatherings (for example such as visiting friends or relatives or meeting informally in public places)?

### Extent of participation

How often do you engage social gatherings (for example such as visiting friends or relatives or meeting informally in public places)

### Satisfaction with level of participation

How satisfied are you with your social life?

# Example of CRIS Questions

<b>Communication</b>	
<b>d350 Conversation</b>	Starting, sustaining and ending an interchange of thoughts and ideas, carried out by means of spoken, written, sign or other forms of language, with one or more people one knows or who are strangers, in formal or casual settings.
Perceived limitation	Others felt that I interrupted inappropriately when we were talking.
Extent of participation	When speaking with others, how often did you interrupt them inappropriately?
Satisfaction with participation	How satisfied were you with the way that you participated in conversations?

# Conclusion



- **The results of pilot studies demonstrate:**
  - Structural validity (i.e. unidimensionality)
  - Content and construct validity
  - Excellent test-retest reliability

# Development of the CRIS



**JRRD**

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Journal of Rehabilitation Research & Development

## Development of CRIS: Measure of community reintegration of injured service members

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**Abstract**—Identification and prevention of community reintegration problems of veterans is an important public health mandate. However, no veteran-specific measure exists. Study purposes were to (1) develop the Community Reintegration for Service Members (CRIS) measure and (2) test the validity and reliability of the measure. Formative research identified challenges in community reintegration postdeployment. The World Health Organization's International Classification of Functioning, Disability and Health participation domain guided item-bank development. Items were refined through cognitive interviews and clinician consultation. Pilot studies with 126 veterans examined unidimensionality, internal consistency, reliability, and construct validity. Three unidimensional CRIS scales were developed. Working subjects had better CRIS scores than unemployed subjects. Subjects with posttraumatic stress disorder, substance abuse, or mental health problems had worse

### INTRODUCTION

More than 1.5 million U.S. soldiers, sailors, and marines have been deployed in Operation Iraqi Freedom and Operation Enduring Freedom (OIF/OEF). Demobilization and the return home can be challenging, especially for injured veterans [1–2]. The ultimate goal of rehabilitative efforts is to help those injured adjust to life at home and in the community [3], which is also called community reintegration. Community reintegration is especially challenging for injured veterans because it may be

**Abbreviations:** ANOVA = analysis of variance; CAT = computer-adapted testing; CHART = Craig Handicap Assess-

Formative Research



Development of CRIS Item Set



Revision of Item Set



Development of Fixed Form Measure



Development of CAT: Field study with 1 year follow-up



Testing Fixed Form in Severely wounded sample



Mode of Administration study



Development of audio-assisted CAT software



Testing in mTBI Sample



**VA HSR&DDHI-07-144 A  
Computer Adaptive Test to  
Measure Community  
Reintegration**



# Objectives



- 1. Develop the CRIS into a computer adaptive test (the CRIS-CAT)**
- 2. Assess psychometric characteristics of the CRIS-CAT including concurrent, discriminant and predictive validity**
- 3. Use the new measure to compare and contrast community reintegration outcomes in 3 groups of veterans whose outcomes were expected to span the spectrum**

# Study Design



- **Field study of veterans**
  - Data collection began in February 2008
  - Data collection just completed February 28, 2010
- **Follow-up cohort of OEF/OIF veterans**
  - Sample followed for one year, CRIS fixed form measure re-administered

# Data



- **Data collected through CAPI**
  - CAPI developed using QDS software
  - Measures include CRIS items, SF-36, QOL, CHART, etc.
- **Diagnostic and Health care utilization data**
  - Extracted from the VA Austin SAS databases
  - Will be linked by social security numbers to study data

# CRIS Item Set



- Over 300 items being tested
- Questions organized into three scales:
  - Extent of Participation
  - Perceived Limitations
  - Participation Satisfaction

# Field Study Sample (N=517)



- **A: 69** veterans with “Good Community Integration”
  - <60 with housing stability and steady employment, without depression, PTSD, or substance abuse
- **B: 99** veterans with “Poor Community Integration”
  - <60 who are homeless, and/or chronically unemployed
- **C: 332** OIF/OEF veterans
  - community reintegration hypothesized as spanning the full range of the scale
- **17** veterans who did not fit other categories

# CAT Development



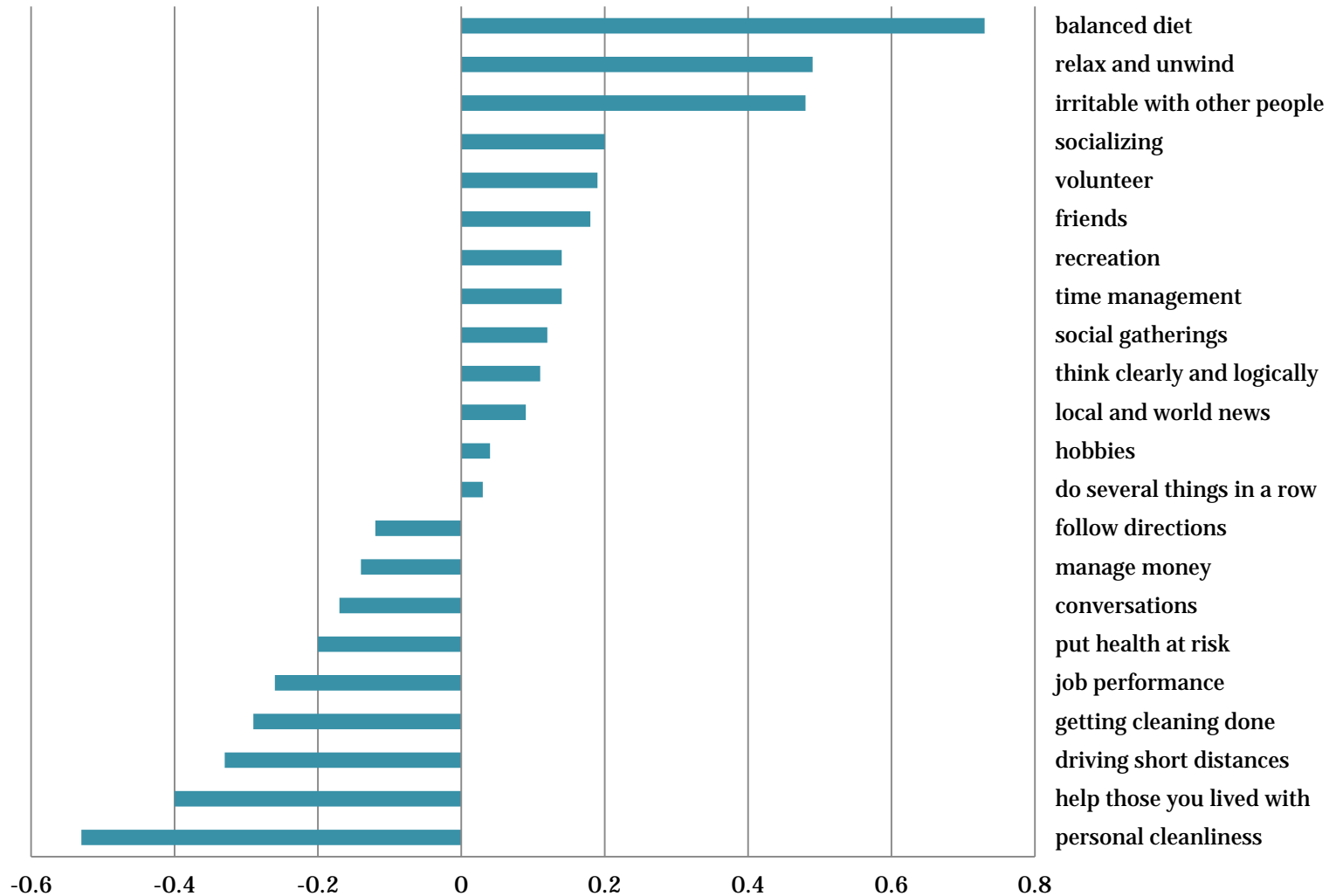
- Exploratory factor analyses (EFA)
- Confirmatory factor analysis (CFA)
- Item sets refined
- Separate one-parameter Rasch partial credit models fit to calibrate items
- Item-person map, weighted fit statistics or mean square (MNSQ) infit statistics evaluated

# CAT Scales



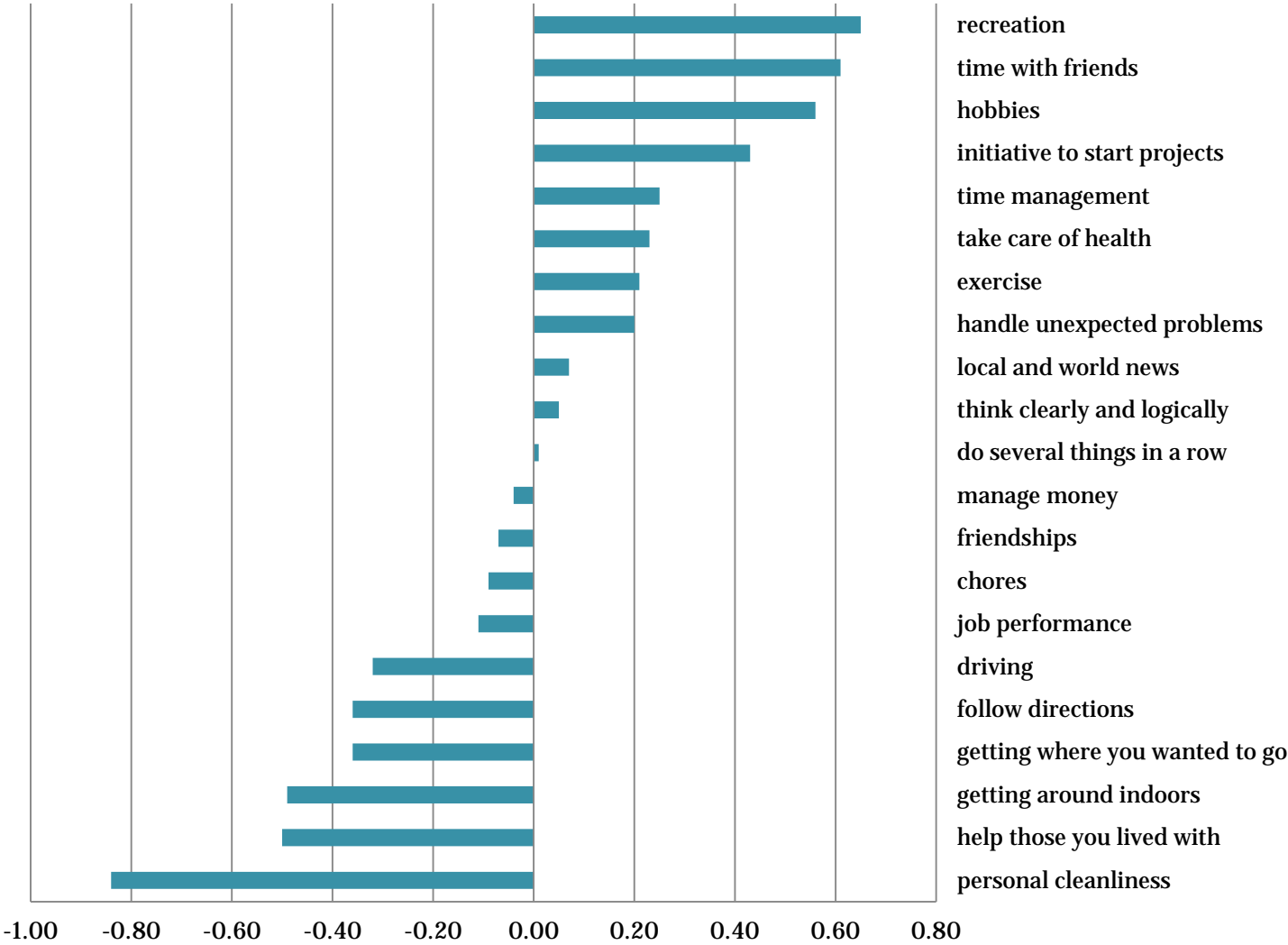
- **Resulting scales**
  - Extent Scale 77 items
  - Perceived 144 items
  - Satisfaction 86 items
- **Data simulations on 517 subjects**
  - Score precision with 95% CI achieved with
    - 20 items Extent
    - 16 items Perceived
    - 14 items Satisfaction
- **10 minutes to administer**

## Item Difficulty: Perceived Limitations in Participation





# Item Difficulty: Satisfaction with Participation



# CRIS-CAT Summary



- **Population-specific measure developed for Veterans**
- **Scales demonstrated construct, concurrent and predictive validity**
- **3 Undimensional scales**
  - Extent of participation
  - Perceived limitations in participation
  - Satisfaction with participation

# CRIS-CAT

JRRD

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## Computer-adaptive test to measure community reintegration of Veterans

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**Abstract**—The Community Reintegration of Injured Service Members (CRIS) measure consists of three scales measuring extent of, perceived limitations in, and satisfaction with community reintegration. Length of the CRIS may be a barrier to its widespread use. Using item response theory (IRT) and computer-adaptive test (CAT) methodologies, this study developed and evaluated a briefer community reintegration measure called the CRIS-CAT. Large item banks for each CRIS scale were constructed. A convenience sample of 517 Veterans responded to all items. Exploratory and confirmatory factor analyses (CFAs) were used to identify the dimensionality within each domain, and IRT methods were used to calibrate items. Accuracy and precision of CATs of different lengths were compared with the full-item bank, and data were examined for differential item functioning (DIF). CFAs supported unidimensionality of scales. Acceptable item fit statistics were found for final models. Accuracy of 10-, 15-, 20-, and variable-item CATs for all three scales was 0.88 or above. CAT precision increased with number of items administered and decreased at the upper ranges of each scale. Three items exhibited moderate DIF by sex. The CRIS-CAT demonstrated promising measurement properties and is recommended for use in community reintegration assessment.

**Key words:** community reintegration, computer-adaptive test, disability, factor analysis, measurement, military healthcare, outcomes assessment, participation, rehabilitation, Veterans.

### INTRODUCTION

(Operation Iraqi Freedom/Operation Enduring Freedom [OIF/OEF]). Studies of OIF/OEF Veterans report a high prevalence of problems related to posttraumatic stress disorder (PTSD), anxiety, major depression, and mild traumatic brain injury [1–4], which can pose substantial challenges to community reintegration. Helping our newest cohort of combat Veterans adjust to life at home and in the community and return to healthy participation in major social life roles is a priority.

The early identification and prevention of problems in the community reintegration of combat-deployed Veterans and the evaluation of clinical interventions to promote healthy social role functioning require accurate assessment and monitoring of community reintegration.

**Abbreviations:** CAPI = computer-assisted personal interviews, CAT = computer-adaptive test, CFA = confirmatory factor analysis, CFI = comparative fit index, CRIS = Community Reintegration of Injured Service Members, DIF = differential item functioning, EFA = exploratory factor analysis, ICF = International Classification of Health and Functioning, IRT = item response theory, OIF/OEF = Operation Iraqi Freedom/Operation Enduring Freedom, PTSD = posttraumatic stress disorder, PVAMC = Providence Department of Veterans Affairs Medical Center, RMSEA = root mean square error approximation, TLI = Tucker–Lewis Index, VA = Department of Veterans Affairs.

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## Reliability, validity and administrative burden of the community reintegration of injured service members computer adaptive test (CRIS-CAT)"

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Linda Resnik, Matthew Borgia  
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# Empirical Data



- **Suggests that participation is a latent trait**
  - Psychometric approach to measurement is appropriate
- **Findings supports ICF Annex method #4 of differentiating between activities and participation**

# Future Research Needs



- **Confirm the conceptualization of Participation by reproducing the CRIS-CAT approach to develop other population-specific participation measures**
  - Use Annex #4 approach to define Participation
  - Keep objective, subjective and satisfaction dimensions separate
- **Examine applicability of the CRIS-CAT to non-Veterans**
  - Persons reintegrating after traumatic injury
  - Persons with psychiatric illness

# Future Research Needs: CRIS-CAT



- **Large cross-sectional studies to obtain normative values for CRIS-CAT scales**
- **Longitudinal studies to examine stability of CRIS-CAT scales**
- **Controlled clinical trials to examine responsiveness of CRIS-CAT scales after interventions designed to improve participation**

# Future Research Needs



- **Cross-sectional studies to understand factors related to participation**
- **Cross-sectional and longitudinal studies to understand if and how determinants of participation vary by sex, age, other factors**
- **Longitudinal research to understand how changes in environment and personal factors impact participation**

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