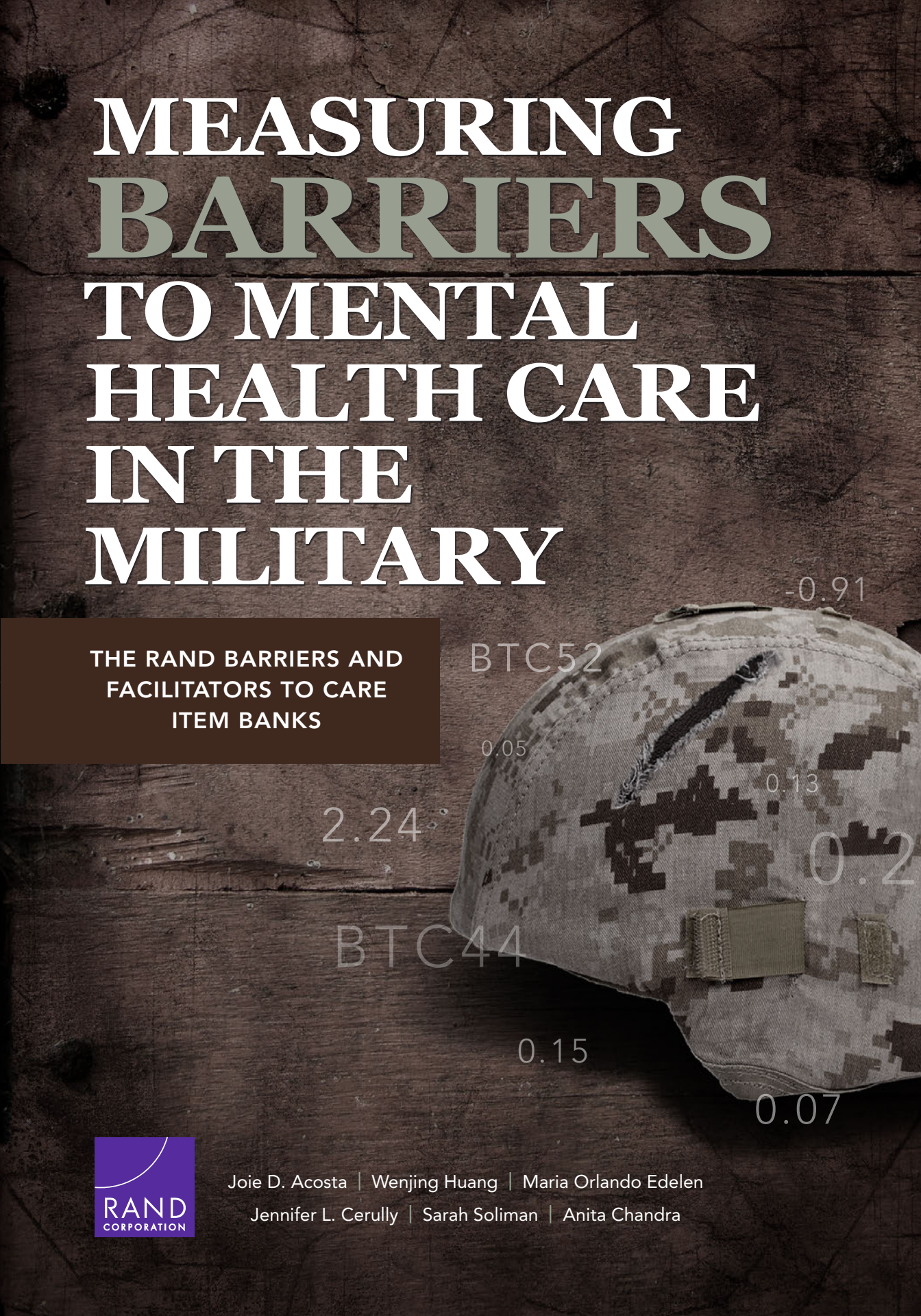
MEASURING BARRIERS TO MENTAL HEALTH CARE IN THE MILITARY

THE RAND BARRIERS AND FACILITATORS TO CARE ITEM BANKS



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Preface

U.S. military service members report a variety of barriers, both logistical (e.g., difficulty scheduling an appointment) and attitudinal (e.g., negative beliefs about treatment), to seeking mental health care. However, at the time of this report, there was no ongoing systematic assessment across the military of barriers that prevent service members from seeking care or of facilitators that encourage it. Understanding these barriers and facilitators is key to informing interventions aimed at increasing care-seeking and enhancing utilization of mental health treatment among service members in need.

To address this gap, the RAND National Defense Research Institute (NDRI) was asked to conduct a study to

- develop an item bank—a repository of survey questions phrased in a nonbiased way about different aspects of mental health treatment and avoidance—to use in military surveys about barriers to seeking mental health care (i.e., a way of capturing service members' self-reported barriers, encompassing care avoidance before and after contact with services)
- establish the reliability and preliminary validity of the item bank and a short form (i.e., a subset of items from the bank that can be used as a short survey)
- identify options for how the U.S. Department of Defense (DoD) can use the item bank to assess and monitor barriers to mental health care.

To develop the item bank, we constructed a preliminary pool of items from a broad scan of the literature and a series of expert and service member interviews, and then field-tested the pool of items with 3,676 service members. Next, a series of factor analyses and analytic tests to detect the different dimensions the items assess (e.g., transportation issues, access to care) and differences in how each item functions were conducted to finalize the item bank. Our analyses resulted in the creation of two item banks—a 54-item bank assessing barriers to mental health care and a six-item bank assessing facilitators of care—and a 15-item survey (short form) culled from the barriers bank. These item banks can be used in DoD surveys to track trends in perceived barriers to and facilitators of mental health care and to identify which barriers and facilitators predict help-seeking by service members.

The contents of this report should be of particular interest to policymakers and health policy officials within DoD, as well as policymakers in other sectors who sponsor or manage efforts to reduce barriers to mental health.

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Summary

Many service members report suffering from mental health conditions, such as depression, posttraumatic stress disorder (PTSD), and problematic substance use. While the proportion of service members initiating treatment has increased in the past decade, fewer than half of the service members who indicate a need for mental health services actually receive care (Gorman et al., 2011; Owens, Herrera, and Whitesell, 2009; Schell and Tanielian, 2011; Hawkins et al., 2010; Ramchand et al., 2015). Service members report a variety of barriers, both logistical (e.g., difficulty scheduling an appointment) and attitudinal (e.g., negative beliefs about treatment), to seeking mental health care (Hoge, Castro, et al., 2004; Hines et al., 2014; Gould et al., 2010; Brown et al., 2011; Kim et al., 2011; Vogt, 2011).

Several surveys with questions about stigma and other barriers to care in the military (e.g., Department of Defense Health Related Behaviors Survey of Active Duty Military Personnel and another conducted by the Mental Health Advisory Team) have been implemented, but there is no annual or biennial, standardized and comprehensive assessment of barriers and facilitators across the active and reserve components of the U.S. Department of Defense (DoD), including the National Guard and reservists. Assessing barriers to and facilitators of mental health care is crucial to understanding what may prevent or delay care and what may encourage care-seeking so that we can understand whether programs aimed at increasing care-seeking, addressing key barriers, and improving appropriate treatment utilization are successful.

The RAND National Defense Research Institute (NDRI) was asked to conduct a research study to

- develop an item bank—a repository of questions about different aspects of mental health treatment and avoidance—to use in military surveys about barriers to seeking mental health care (i.e., a way of capturing service members' self-reported barriers to mental health care)
- establish the psychometric properties (i.e., reliability and preliminary validity) of the item bank and a short form (i.e., a subset of items from the bank that can be used as a short survey)
- identify options for how DoD can use the item bank to assess and monitor barriers to such care.

During the course of the study, we also identified a series of facilitators of mental health care. Therefore, we expanded the study scope to cover both barriers and facilitators.

An item bank is a set of items that have been assembled and cataloged so that they can be used interchangeably to assess a single construct (e.g., barriers to care). Because the items are cataloged with known properties about question difficulty (e.g., reading level) and relevance to what is being measured, item-bank users can select from different sets of items of varying content and size (e.g., number of items), but the scores yielded by a chosen set can still be compared with the scores from a slightly different set.[1] Traditional measurement scales capture a single construct through the use of a fixed set of items. Item banks similarly capture a single construct, but the sets of individual items vary.

Typically, an item bank contains the item wording and response options for each item, as well as some form of statistical and performance information about each (i.e., item properties). Item banks are flexible enough to incorporate new questions based on future research, as long as item properties are established for the new items. Because of their varied content, short forms of questions can be developed and used over time to avoid fatiguing respondents by asking the same questions over time (Cella, Gershon, et al., 2007).

This report summarizes the findings of a study to construct an item bank of barriers to mental health care for DoD. It is important to note that the study does not assess the quality of mental health care or the myriad of challenges or problems that may arise during the course of treatment. There are unique challenges and opportunities for developing measures related to quality of care that go beyond the scope of this report (Pincus, Spaeth-Rublee, and Watkins, 2011; Kilbourne, Keyser, and Pincus, 2010). We recognize that the treatment system may present a host of unique barriers for service members and that individuals are also influenced by the larger social, economic, and political context of their location. However, this report focuses on the measurement of barriers to and facilitators of service member initiation (or reinitiation) of care related to the individual, social networks, treatment, and military norms.

In this report, when we refer to *barriers to* or *facilitators of care*, we are specifically referencing *mental health care*. When we refer to *treatment*, the term can include care from a paraprofessional, such as a chaplain, or care from a professional, such as a psychologist, counselor, or general practitioner.

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[1] In this report, *score* refers to the item response theory (IRT) scale score. The IRT scale score can be determined from the summed score using tables to translate the summed score to IRT scale score (Tables D.8 and D.9 in Appendix D). This translation table is generated using IRTPRO software and is based on the item parameters established through our IRT analyses.

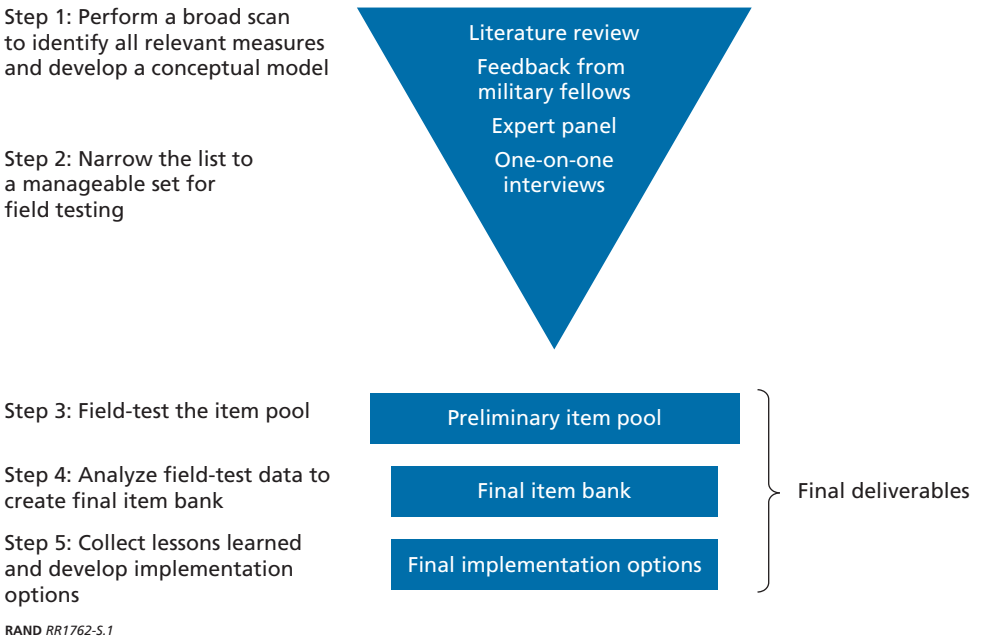
Study Methods

This study used a mixed-method approach, which is common for developing item banks (Cella, Yount, et al., 2007; DeWalt et al., 2007). As shown in Figure S.1, we first conducted a literature review to identify relevant measures and scales. The results were used to create a large database of existing survey items for assessing barriers to care and to develop an initial framework that highlights influences that can create or prevent barriers to mental health care. Then, we conducted interviews with RAND military fellows (i.e., active-duty service members in a one-year program in which they participate in research projects, seminars, and discussion groups at RAND) to further develop the framework.

Guided by the framework, we narrowed our list of survey items using feedback elicited through one-on-one interviews with current service members and an expert panel. Once a set of 131 preliminary items were selected, we field-tested these items with 3,676 service members in the Air Force, Army, Marine Corps, and Navy at military installations around the country.

The data collected during the field test were used to establish psychometric properties for each item in the pool, and these properties were then used to select the final sets of items for two item banks: a 54-item barriers to mental health care item bank (referred to herein as the barriers bank) and six-item facilitators of mental health care item bank (facilitators bank). Specifically, we conducted exploratory and confirmatory factor analysis, as well as differential item functioning (DIF) and IRT analyses to develop the final item banks. The purpose of the factor analyses was to determine the number of dimensions present in the item pool, and hence the number of item banks. We found that a two-factor solution resulted in the best model fit, so we developed two banks (barriers and facilitators banks). Within each bank, DIF and IRT analyses were used to evaluate items based on their psychometric functioning and performance relative to the other items in the bank and to create a short form for the 54-item barriers bank containing just 15 items. To help guide recommendations for how DoD can use the item banks, we also sought input on options for utilizing the item banks from a group of DoD stakeholders.

Figure S.1
Study Methods



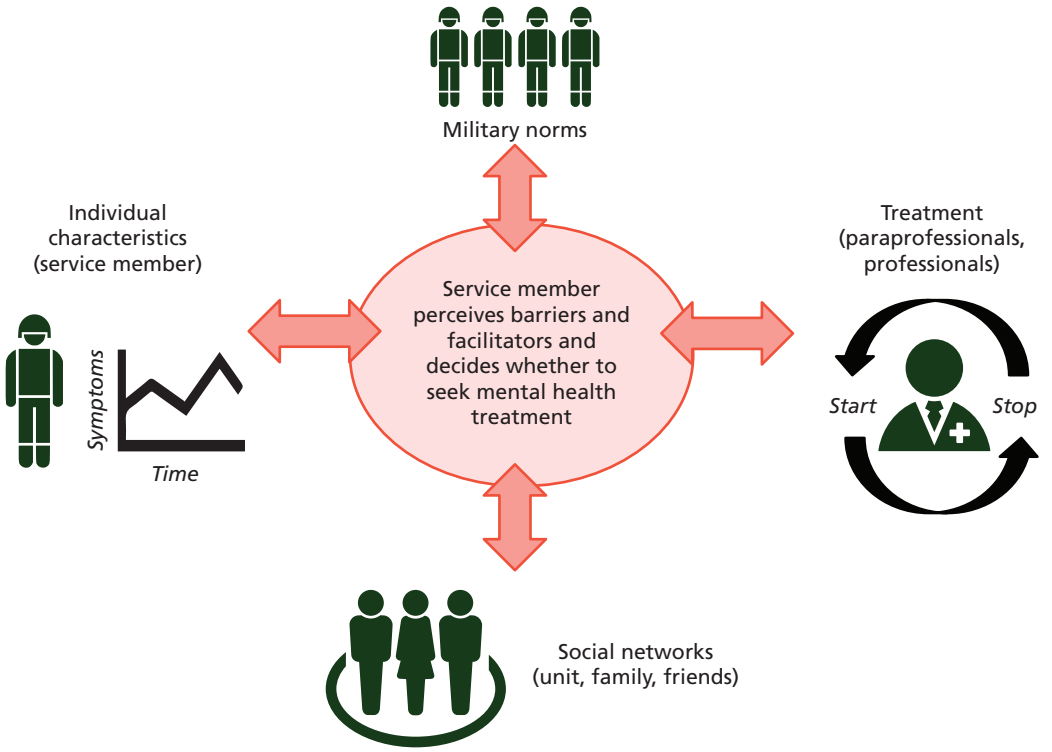
Conceptual Model of Influences on a Service Members' Decision to Seek Care

To ensure that the banks covered a myriad of possible barriers to and facilitators of mental health care, we developed a framework to visually represent the key influences on a service member's perceptions of mental health care and decision to seek care (Figure S.2). The framework is based on three key assumptions:

1. The development of mental health problems is a dynamic process in which symptoms can become more or less severe over time.
2. Service members can address mental health problems through a variety of strategies, including personal coping, social support networks, and treatment (i.e., paraprofessional or professional).
3. The treatment process is complex (e.g., an individual can start and stop treatment many times) and there are many things that can affect a service member's decision to initiate, continue, or stop treatment (e.g., when new stressors are introduced or chronic stressors reach a critical threshold).

The framework also considers four key influences (Table S.1). First, barriers or facilitators may be related to individual characteristics (including attitudes toward and perceptions of mental health conditions and treatment), shame and blame, and an

Figure S.2
RAND Conceptual Framework Outlining Possible Influences on Service Members' Decision to Seek Mental Health Treatment



NOTE: The framework focuses on barriers to service members' initiation or reinitiation of mental health care—which may include perceptions of treatment and past experiences with mental health treatment—and not on the quality of mental health care or barriers experienced while receiving care.

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individual's general approach to help-seeking (i.e., whether the person tends to get help when sick). Second, a person's interactions with social networks (friends, family, unit, and others) can increase or decrease the likelihood that the person will initially seek care, depending on the nature of these interactions. For example, a friend with a negative perception of treatment could discourage the service member from seeking help. Third, barriers or facilitators related to treatment (e.g., concerns that treatment will not be kept confidential, difficulty getting an appointment) can also affect service members' decision to continue or discontinue care. Finally, barriers or facilitators related to military norms can influence service members' decision to seek care. For example, service members may be concerned that seeking care or showing emotion would be seen as weak. Items in the bank were reviewed to ensure that they covered specific barriers or facilitators related to each these four influences.

Table S.1
Content Covered in the RAND Barriers to and Facilitators of Mental Health Care Item Banks

Categories from the RAND Conceptual Framework	Final List After Input from Military Fellows, One-on-One Interviews, and Expert Panel
Barriers or facilitators related to the individual	Attitudes toward mental health care (compared with more traditional health care)
	General approach to help-seeking
	Perceptions of the origin of mental health problems
	Internalized barriers (i.e., shame and blame)
Barriers or facilitators related to social networks (friends, family)	Attitudes toward individuals with mental health problems
	Attitudes toward mental health care
	Perception of burden to family, friends, society
	Concerns about being labeled with a mental health problem
	Concerns about career
	Public disclosure of mental health problems
	Reactions of social support network
	Social isolation and distance
Barriers or facilitators related to treatment	Concerns about the confidentiality of the care process
	Logistics of accessing care
	Perceptions of the treatment process
	Preferences for nonprofessional care (family, friend, chaplain, or others)
	Public reactions to treatment-seeking
Barriers or facilitators related to military norms	Strength
	Stoicism
	Part of a unit

RAND Item Banks to Measure Barriers to and Facilitators of Mental Health Care

Table S.2 lists the items in the 15-item short form (culled from the 54-item barriers bank) and those in the six-item facilitators bank to measure barriers to and facilitators of care related to the individual, social networks, treatment, and military norms. A full list of the barriers bank items can be found in the main report (Chapter Four).

Table S.2
Items in the RAND Barriers Short Form and Facilitators Bank

Barriers to Mental Health Care (15-Item Short Form)	Facilitators of Mental Health Care (Six-Item Bank)
1. I would be taken less seriously if I had mental health problems. 2. If I had mental health problems, I would not seek professional help because treatment does not work. 3. If I had mental health problems, I would not seek treatment because it would take time away from serving my unit. 4. If I had mental health problems, I would be uncomfortable seeking professional help because people might find out about it. 5. If I had a mental health problem, other service members would not be very tolerant of my problems. 6. If I had mental health problems, it would be viewed as a sign of personal failure. 7. If I were suffering from mental health problems, I would feel responsible for my problems. 8. I would not be respected if I talked about my worries, fears, and problems. 9. If I sought mental health treatment, I would be seen as weak. 10. If I were having mental health problems, I would feel that I was a burden on my family or friends. 11. I would be given less responsibility if my chain of command knew I was seeking professional help for mental health problems. 12. If I had mental health problems, members of my unit would have less confidence in me. 13. If I were getting help from a mental health provider, my peers would think less of me. 14. If I were diagnosed with a mental health problem, I would feel stigmatized. 15. If I had mental health problems, people would feel awkward and tense when around me.	1. It is possible for people with mental health problems to recover. 2. If I had mental health problems, it would be easy for me to find the time to see a professional for those problems. 3. People that I am close to would support me in seeking mental health treatment. 4. If I had mental health problems, I would be comfortable talking about them with a counselor or professional. 5. If friends learned that I received treatment for mental health problems, they would be supportive and understanding. 6. If I had mental health problems, I would receive good professional care from the military.

NOTE: The response options for these items are on a Likert scale from 1 to 5 (not at all, a little bit, somewhat, quite a bit, very much).

We also conducted a series of preliminary validity analyses using the barriers bank score (54 items), short-form score (15 items), and facilitators bank score (six items):

- **Comparing with established measures:** Correlations between the barriers bank score and two established similar scales were high (0.76 with the Britt scale [Britt, Greene-Shortridge, et al., 2008]; 0.78 with the Hoge scale [Hoge, Castro, et al., 2004]), indicating good convergent validity of the barriers bank. The barrier bank score correlated moderately (0.40) with the male norms scale [Levant, Hall, and Rankin, 2013], suggesting that male norms of stoicism and independence may only be a part of the overall barriers to care. The barriers short-form score also correlated with the three additional scales in a similar fashion (0.74 with the Britt scale; 0.76 with Hoge scale; and 0.40 with the male norms scale). Correlations

between the facilitators bank score and the three additional scales were moderate to low (0.50 with the Britt scale; 0.56 with Hoge the scale; and 0.30 with the male norms scale), suggesting that facilitators overlap with but are still distinct from barriers.

- **Examining demographic variation:** As anticipated, t-tests and regression analyses found no differences in barriers item bank and short-form scores that were due to age, gender, and component (active or reserve); education (high school or less, some college and four-year college or more); or service branch (the Air Force, Army, Marine Corps, or Navy).
- **Examining differences based on presence of mental health symptoms:** We found that people exhibiting symptoms of PTSD or depression all had significantly higher barriers bank and short-form scores than those without symptoms. This is consistent with past research on military populations that has found that those with mental health problems report more barriers to care (Clement et al., 2015).
- **Examining differences by preferences for nonprofessional care:** Service members' help-seeking behavior (specifically preferring family or friends, instead of professionals) was found to be significantly correlated with both the barriers bank and short-form scores (0.24 with the bank score and 0.23 with the short-form score) and had a near-zero correlation with the facilitators bank (0.06 with the scale score). Past research has suggested that service members who have a strong preference for nonprofessional care are less likely to seek treatment (Acosta, Becker, et al., 2014; Adler et al., 2015). The small correlations suggest that the barriers bank and short-form scores are related, in a limited way, to these preferences.
- **Examining differences by general versus disorder-specific items:** We found that service members' endorsement of barriers to care may vary if they are asked about a specific disorder instead of general mental health problems. Therefore, if DoD changes the language of bank items from general to disorder-specific, it will change the item properties and potentially negatively influence their ability to accurately capture barriers across the military population. A disorder-specific item bank would need to be created if there is a desire to learn more about specific disorders.

Options for Utilizing the Item Banks

Through discussions with 20 experts in survey methodologies for service members or veterans and mental health, we identified four options for how DoD could utilize the item banks. The first three focus on considerations for using the item banks as part of data collection across the military (i.e., enterprisewide) or evaluation of interventions to reduce barriers to care. The fourth option focuses on a more staged approach, allow-

ing for smaller-scale pilot tests of the item banks before any enterprisewide utilization. If data collection across the military is required, DoD could consider leveraging existing survey efforts by embedding bank items into an ongoing survey. In particular, the Health Related Behaviors Survey may be a potential place to field items from the banks because it is collected every two to three years, recruits for a representative sample of service members across both the active and reserve components, and already contains some items capturing barriers to care.

Option 1: Use the Item Banks to Track Trends in Service Members' Perceived Barriers to and Facilitators of Mental Health Care

DoD could conduct or embed items from the banks into an ongoing longitudinal cross-sectional survey with a representative sample of service members. It could purposefully stratify the sample to allow meaningful comparisons by service branch, installation, battalion, or other levels of interest. This option, if carried out repeatedly over time, could help to answer the following basic questions:

- What are the most prevalent barriers to care?
- How is the prevalence of barriers to facilitators of care changing over time?

In addition, this option would allow DoD to determine whether there are any specific groups (e.g., based on demographic, pay grade) reporting more barriers that should be targeted for specific intervention.

Option 2: Assess How Specific DoD Interventions Affect Self-Reported Barriers to and Facilitators of Care

To answer the question, "How do specific DoD interventions affect self-reported barriers to and facilitators of care?" DoD would need to time the aforementioned survey to occur before and after the interventions of interest; in addition, questions on the respondent's exposure to the interventions would need to be added to the survey. For example, if DoD is interested in understanding whether videos showing strong and successful service members who received mental health treatment are reducing perceived barriers related to military norms (e.g., fear of being seen as weak, fear that sharing emotions will be viewed unfavorably) among junior enlisted service members, DoD would need to include a series of questions assessing exposure to the videos. This approach is only able to assess the aggregate effects of all interventions on barriers and facilitators, and is not able to isolate a single intervention's effect on barriers or facilitators. It may be useful for DoD to survey a control group (service members not exposed to the specific intervention) to better isolate the effects on barriers to and facilitators of care that can be attributed to the specific intervention.

Option 3: Assess Which Perceived Barriers and Facilitators Predict Help-Seeking Behaviors

To answer the question, "Which barriers and facilitators predict help-seeking among service members?" DoD would need to administer a survey to a representative sample of service members (similar to option 1). However, to understand whether certain barriers or facilitators prospectively affect treatment-seeking, a longitudinal sample would be required, with tracking over time focused primarily on service members who screen positive for a mental health problem (e.g., PTSD, depression, anxiety) and those receiving treatment. This option would require the use of a unique identifier to either link service members' survey data over time or link survey data with treatment utilization data, which would mean that data collection could be confidential but not anonymous. This could be of concern to service members and requires careful consideration and communication about who would administer the item banks (an entity internal or external to DoD) and how the information would be used.

It is worth noting that two recent longitudinal studies (Acosta, Becker, et al., 2014; Adler et al., 2015) found two predictors of care-seeking: (1) service members who preferred family and friends over professional care were less likely to seek care; and (2) service members who believed that treatment seeking is helpful and takes courage were more likely to seek care. However, these studies did not recruit a representative sample of service members; therefore, it is unclear whether these predictors are universal (across DoD) or specific to the subgroups surveyed.

Option 4: Conduct Pilot Test(s) to Help Identify the Best Ways to Deploy the Item Banks

DoD could consider pilot test(s) to determine the most beneficial ways to use the item banks. Pilot tests of option 1 and option 2 could be funded to determine their feasibility (e.g., response bias, mode, lead agencies that should be involved). In particular, a pilot test of option 3 may yield important information about which barriers or facilitators to prioritize for data collection across the enterprise (i.e., prioritize those that most strongly predict help-seeking and are modifiable through intervention). DoD could also conduct small-scale studies to empirically link specific interventions with reductions in barriers to care or improvements in facilitators of care and to guide specific quality-improvement activities at installations or military treatment facilities.

Limitations

The item banks focus on facilitators or barriers to treatment initiation and does not capture perceptions of the quality of care for service members in treatment. They focus on mental health problems generally and not on a specific mental health disorder (e.g., depression, PTSD). The field-test sample used to develop the item banks was

slightly older and more educated than the military population. Finally, the item banks will need to be updated over time as new research identifies barriers to and facilitators of care not covered by the current barriers or facilitators banks.

Conclusion

The barriers bank and facilitators bank have great potential for monitoring barriers to and facilitators of care in ways that have not been done before. In particular, the item banks address several limitations of existing measures by broadly assessing barriers related to any type of mental health problem and any type of professional care and by covering a variety of types of barriers related to the individual, social networks, treatment process, and social norms (Acosta, Becker, et al., 2014). The item-bank approach allows for more-flexible (i.e., can use different subsets of items to create a variety of short forms) and more-adaptive (i.e., can be updated over time as new research emerges) monitoring of barriers to and facilitators of care and, if used in any of the suggested ways, could provide crucial insight to DoD on the obstacles that service members face to improving their mental health.

Implementing a monitoring system using the item banks will require coordinated planning efforts, leadership support, and significant resources to implement surveys that derive meaningful and actionable results. To be most effective, implementation should include not only getting the system up and running but also regularly sharing findings from any data collected (and possibly data sets) with key audiences (e.g., installation commanders, directors of military treatment facilities). Because of the flexibility of the item banks, we offer a number of considerations to DoD for utilizing the item banks in ways that could track trends or evaluate interventions to reduce barriers to seeking mental health care.

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Abbreviations

AUSA	Association of the United States Army
BTC	barrier to care
CFA	confirmatory factor analysis
CFI	comparative fit index
DEOMI	Defense Equal Opportunity Management Institute
DIF	differential item functioning
DoD	U.S. Department of Defense
EFA	exploratory factor analysis
IAVA	Iraq and Afghanistan Veterans of America
IRB	institutional review board
IRT	item response theory
MR	marginal reliability
NCO	noncommissioned officer
NIMH	National Institute of Mental Health
PTSD	posttraumatic stress disorder
RCS	report control symbol
RMSEA	root mean squared error of approximation
TLI	Tucker-Lewis index
UCLA	University of California, Los Angeles
VA	U.S. Department of Veterans Affairs
wABC	weighted Area Between the expected score Curves

CHAPTER ONE

Introduction and Purpose

Many service members who return from deployment report experiencing mental health challenges, such as depression, posttraumatic stress disorder (PTSD), and problematic substance use. Yet, fewer than half of the U.S. service members and recent veterans who indicate a need for mental health services actually receive treatment (Gorman et al., 2011; Owens, Herrera, and Whitesell, 2009; Schell and Tanielian, 2011; Hawkins et al., 2010; Ramchand et al., 2015) because, in part, of stigma and other barriers to care. This puts service members' well-being—and potentially their units' missions—at risk. However, at the time of this report, no annual or biennial, standardized and comprehensive measures of these barriers to and facilitators of care are being collected across the active and reserve components of the U.S. Department of Defense (DoD), including National Guard and reservists. To fill this gap, we developed a large bank of items to use as survey questions for service members (active duty or reserve) and considerations for how to use them.

More than 2.7 million service members have deployed to support operations in Iraq and Afghanistan since 2001 (Watson Institute for International and Public Affairs, 2015). Estimates of the number of service members with mental health challenges vary widely by occupational specialty, combat exposure, treatment-seeking behavior, and other factors. For example, Kok et al. (2012) found that the unit-specific prevalence of PTSD among operational infantry exposed to combat was 13.2 percent versus 5.5 percent in a sample with a high proportion of support personnel. Ramchand et al. (2015) reviewed prevalence estimates among nontreatment–seeking military populations deployed to Iraq and Afghanistan and found wide variability in the reported prevalence of PTSD (0–49 percent), depression (4–45 percent), and substance misuse (4–66 percent).

Prevalence also varied by demographics. For example, female service members and those not in a relationship were at increased risk for depression (Carter-Visscher et al., 2010; Kehle et al., 2011; Luxton, Skopp, and Maguen, 2010; Elbogen et al., 2013; Haskell et al., 2010; Maguen, Madden, et al., 2014; Maguen, Cohen, et al., 2012; Maguen, Ren, et al., 2010); and individuals with lower levels of education and who were not in a relationship (e.g., single, divorced, separated, or widowed) were at an increased risk for PTSD (Ramchand et al., 2015); black Marines had a lower risk

for PTSD (Mayo et al., 2013), and white veterans had an increased risk for depression (Maguen et al., 2012). The *Medical Surveillance Monthly Report* (Military Health System and the Defense Health Agency, undated) estimated that 232,184 members of the active component received an initial mental health disorder diagnosis and 288,767 mental disorder treatment courses[1] were provided in 2012—an increase of at least 75 percent in both diagnoses and treatment since 2000.

Engagement in treatment has increased in the past decade; however, care is sometimes inadequate. A 2016 study found that only one-third (34 percent) of patients newly diagnosed with PTSD and 24 percent of those with depression received minimally adequate care (four psychotherapy or two medication management visits) within the first eight weeks following diagnosis (Hepner et al., 2016). Without appropriate treatment, these mental health problems can have wide-ranging and negative effects on the quality of life and the social, emotional, and cognitive functioning of affected service members, and they can negatively affect their relationships with family and friends (Denning, Meisnere, and Warner, 2014; Ramchand et al., 2015).

Service members report a variety of barriers, both logistical (e.g., difficulty scheduling an appointment) and attitudinal (e.g., negative beliefs about treatment), to seeking mental health care (Hoge, Castro, et al., 2004; Hines et al., 2014; Gould et al., 2010; Brown et al., 2011; Kim et al., 2011; Vogt, 2011). A study of service members involved in the conflicts in Iraq and Afghanistan found that negative beliefs about mental health care and lower perceived unit support were associated with veterans perceiving greater barriers to care and reporting they would be less likely to seek counseling (Pietrzak, Johnson, et al., 2009). Although fewer studies have examined the adequacy of mental health treatment, a 2014 study of combat veterans found that the primary reasons reported for dropping out of mental health services included a belief that they could handle problems on their own, work interference, insufficient time with the mental health professional, stigma, treatment ineffectiveness, confidentiality concerns, or discomfort with how the professional interacted (Hoge, Grossman, et al., 2014).

Measures of barriers to care in military populations rarely included two of the most widely endorsed barriers in general population studies—perceived need for treatment and the desire to handle problems on one's own (Andrade et al., 2014; Mojtabai et al., 2011; Sareen et al., 2007). Of note, financial barriers (cost of care) were among the most frequently cited barriers to mental health treatment (Sturm and Sherbourne, 2001; Sussman, Robins, and Earls, 1987; Manning et al., 1986; Taube, Kessler, and

[1] Treatment course is defined as the time from an initial encounter until the last follow-up encounter where each follow-up encounter occurred within 60 days of the preceding such encounter. Initial encounters of treatment courses included each individual's first encounter while in active service; and each encounter that occurred more than 60 days after any prior such encounter. Each individual could have multiple initial encounters and multiple courses of treatment during the surveillance period (Military Health System and the Defense Health Agency, undated).

Burns, 1986; Simon et al., 1996). However, because active-duty military service members receive insurance coverage for mental health services through DoD, we eliminated this barrier from our work.

A Standardized Way to Measure Barriers to Mental Health Care in the Military Is Needed to Better Understand This Complex Problem

While prior studies have examined the prevalence of mental health challenges and the presence of barriers to and facilitators of mental health care, research has focused on just certain subsets of the military population (e.g., special forces, combat exposed) (Ramchand et al., 2015). In addition, several surveys with questions on stigma and other barriers to care the military (e.g., the DoD Health Related Behaviors Survey of Active Duty Military Personnel, a Mental Health Advisory Team survey for DoD) have been implemented, but the survey data are not collected in a standardized format across DoD (active and reserve components, including National Guard and reservists) over time and do not contain questions on facilitators of care. In short, there is no annual or biennial, standardized and comprehensive assessment of barriers to and facilitators of care across DoD. A systematic assessment is crucial to understanding what barriers may prevent or delay service members from seeking care and what facilitators may encourage them to do so—information that could inform the development of programs to address these barriers, increase care-seeking, and expand utilization of treatment. Acosta, Becker, et al. (2014) specifically called for developing a set of measures to track the prevalence of stigma and other barriers to care and paying specific attention to the role of social networks (e.g., families, friends).

A standardized assessment will also help to more systematically identify variations in barriers among specific higher-risk subpopulations. This information could be used to better tailor interventions to these subpopulations. As previously mentioned, gender, education, and relationship status are associated with increased risk for mental health conditions. Research has also identified risk factors specifically for military populations, including:

- **Service branch**: PTSD and depression are more prevalent among members of the Army and Marine Corps (Khaylis et al., 2011; Armed Forces Health Surveillance, 2012; Andersen et al., 2010; Cohen et al., 2010; Maguen, Ren, et al., 2010; Seal et al., 2009).
- **Officer versus enlisted status**: PTSD and depression are more prevalent among enlisted personnel (relative to officers) (Hickling et al., 2011; Goodwin et al., 2012; Maguen et al., 2010; Seal et al., 2009; Mayo et al., 2013).

- **Component**: Having been on active duty (relative to the reserve component) can increase the risk for PTSD and depression (Pietrzak, Goldstein, et al., 2009; Maguen, Cohen, et al., 2012).

It is unclear whether barriers to care also vary by other demographic or military factors, but a standardized measure employed across the military would offer some answers.

Improved measurement is also needed to address several key limitations of current measures. Specifically, a measure is needed to broadly assess any type of mental health problem involving any type of professional care; to cover a wider array of barriers, including those encountered before and after attempting to seek care; to better reflect the full care-seeking process; and to allow better comparisons between military and civilian populations (Acosta, Becker, et al., 2014).

An item bank is a set of items (i.e., survey questions worded in a nonbiased way) that can be used interchangeably to assess a single construct (e.g., perceptions of stigma or access to transportation). Bank items are assembled and cataloged along with properties about each item's level of difficulty and relevance to what is being measured by the bank. Users can select different sets of bank items and vary both the specific items within the set and the number of items used. Despite the differences, the survey results for one set can be compared with those of a similar set because their properties and the constructs being measured are analogous. Item banks are similar to traditional measurement scales (that capture a single construct through the use of a fixed set of items), except that measurement properties are assigned to each item; this allows users to compose scales with varying content and numbers of items that produce standardized scores on the construct of interest.

Typically, an item bank contains the wording of a question, response options for each item, and some form of statistical and performance information about each item. Item banks are flexible enough to incorporate new questions based on future research, as long as item properties are established for the new items. Because of their varied content, short surveys (called "short forms") can be developed and administered over time to avoid user fatigue from repeatedly answering the same questions (Cella, Gershon, et al., 2007). For example, the Graduate Records Examination used for graduate school admissions utilizes item-bank principles so that test-takers receive different items and numbers of items but produce a standardized set of scores (Hwang, Lin, and Lin, 2006). In the military context, the Armed Forces Vocational Aptitude Battery also uses principles of item banking (Van Der Linden, Scrams, and Schnipke, 1999).

Compared with fixed scales, item banks

- are more useful for tracking outcomes over time because short forms can be developed with different items, all tracking the same construct
- can more easily be updated to keep pace with scientific advancements (Cella, Gershon, et al., 2007).

Study Purpose

To address the limitations of current measurement and better support DoD's efforts to address barriers to mental health care for the military, the RAND National Defense Research Institute (NDRI) was asked to conduct a research study to

- develop a barriers to mental health care item bank to use in military surveys about barriers to seeking mental health care (i.e., a way of capturing service members' self-reported barriers to mental health care)
- establish the psychometric properties (i.e., reliability and preliminary validity) of the item bank and a short form of the bank
- identify options for how DoD can use the item bank to assess and monitor barriers to mental health care.

During the course of the study, we also identified a series of facilitators that encourage service members to seek care, which represented a new construct (i.e., more than just the absence or inverse of barriers). As a result, we expanded the study's scope to cover both barriers to and facilitators of mental health care. It is important to note that the study summarized in this report does not specifically assess the quality of mental health care. Developing measures to quality of care involves unique challenges and opportunities (Pincus, Spaeth-Rublee, and Watkins, 2011; Kilbourne, Keyser, and Pincus, 2010) that go beyond the scope of this report. Also note that, for brevity, when we refer to *barriers* or *facilitators of care*, we are referencing *mental health treatment*. When we refer to *treatment*, the term can include care from a paraprofessional (such as a chaplain) or care from a professional (such as a psychologist, counselor, or general practitioner).

Study Methods

This study uses a mixed-method approach, which is common when developing item banks (Cella, Yount, et al., 2007; DeWalt et al., 2007). As shown in Figure 1.1, we first reviewed the literature to identify existing measures and scales. We used the results to create a large database of survey items for assessing barriers to care and developed an initial framework highlighting factors that can either create barriers to care or minimize them. Next, we interviewed RAND military fellows to further refine the framework. Guided by the framework, we narrowed our list of survey items using feedback from one-on-one interviews with current service members and from an expert panel. The next step was to field-test these items by surveying 3,676 service members in the Air Force, Army, Marine Corps, and Navy at military installations around the United States.

The field-test data were used to establish psychometric properties for each item in the pool, and these properties were then used to select the final set of items for each bank (a 54-item barriers bank and a six-item facilitators bank). Given the size of the barriers bank and the potential for user fatigue, we created a 15-item short form for that bank. To help DoD use the item banks, we also sought input on options for utilizing the item banks from a group of DoD stakeholders. We describe each step in more detail below, and detailed methods are available in the appendixes.

All study procedures were approved by RAND's Human Subjects Protection Committee (which serves as the institutional review board [IRB] at RAND), a DoD-level IRB (from the U.S. Army Medical Research and Materiel Command, Office of Research Protections, Human Research Protection Office), the Air Force Air University Office of Academic Affairs, the Marine Corps IRB, and the DoD Information Collections Program (which issues a report control symbol [RCS] or unique identifier demonstrating DoD approval for information collection).

Literature Review

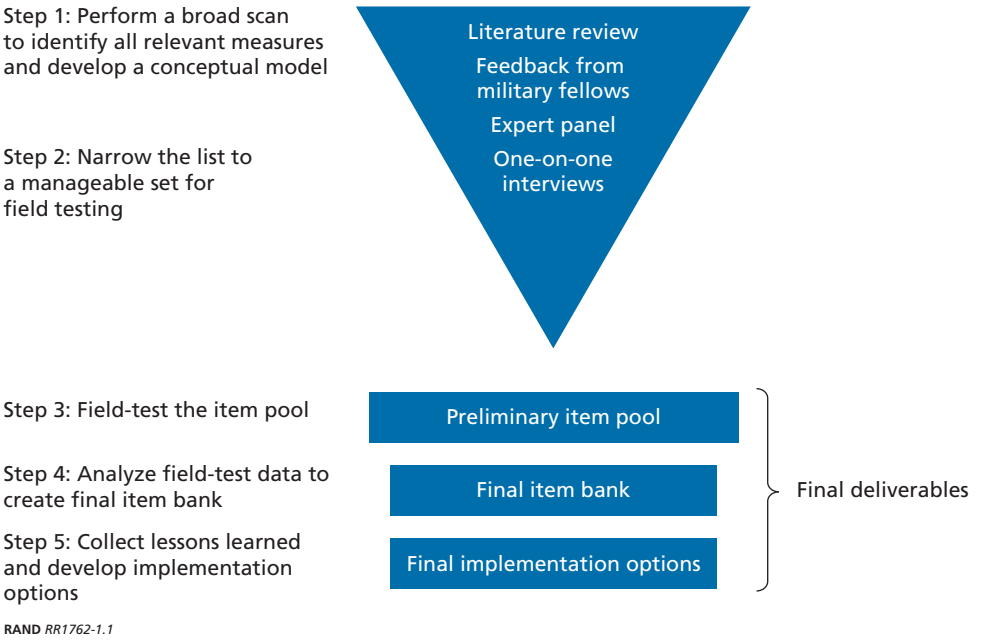
To identify relevant measures, we conducted a comprehensive literature search on mental health stigma and other barriers to care in ten databases that focus on broad substantive areas pertaining to health (psychology and medicine), defense, and the social sciences. We reviewed 208 sources to identify specific measures of barriers to both psychological and general health care, the specific items from each measure (n = *1,607* total items, n = *235* unique items), and theoretical or conceptual models of barriers to care. For each measure identified, we abstracted a standardized set of information using a data abstraction form, noting

- the respondent or target population (clinical sample, military sample, general population)
- the number of items in the measure
- wording for each item in the measure
- results of reliability or validity testing (if performed)
- the type of study (review, experimental, or quasi-experimental).

Feedback from Military Fellows

The RAND Military Fellows Program hosts active-duty service members for one year to participate in research projects, seminars, and discussion groups at RAND. To supplement our knowledge of barriers to mental health care from the literature review and to enrich our understanding of how these barriers operate in the military context, we conducted 18 telephone interviews with male and female RAND military fellows from the Air Force, Army, and Navy who were primarily officers (O-4–O-6) with at least ten years of service. One of the study team members conducted the 30- to 45-minute interviews and took notes on a laptop. Fellows were asked for reasons why some service members hesitate to seek care and how service members view their peers who do get

Figure 1.1
Study Methods



treatment. Fellows then reviewed a preliminary list of barriers to care (derived from the literature) to identify any missing barriers. While no new barriers were identified, fellows specifically suggested that we should give more attention to barriers related to career progression, confidentiality, and military cultural values (e.g., independence, stoicism).

One-on-One Interviews with Military Service Members

To elicit insight on the appropriateness and importance of items in the preliminary item pool, we conducted one-on-one telephone interviews with a convenience sample of ten participants recruited through the RAND Military Fellows Program and veteran service organizations. Participants included active-duty and retired service members, both male and female, ages 20 to 44, from the Air Force, Army, Marine Corps, and Navy. We also interviewed one military spouse. Before the interviews, participants were asked to review a file that contained half of the unique items identified through the literature review (i.e., either 117 or 118 items). During the interview, participants were asked for their general thoughts or reactions to the items they reviewed, and then asked to indicate specific items or language that seemed odd, confusing, difficult to understand, or problematic in the military context. Participants were also asked to indicate items that they thought were especially good or useful. After reviewing each item, participants were asked what other topics, if any, were missing, and whether they preferred different wording or had alternative interpretations of frequently used phrases (e.g., "if you

had mental health problems," "if you sought mental health treatment") in question stems—that is, phrases that are commonly used to begin survey questions measuring the same construct. As a result of the interviews, we deleted items with wording that participants considered inappropriate for the military context (e.g., "coming out of the closet with a mental health disorder"), and we defined the term *mental health problems* so that future respondents would interpret it in a uniform way.

Expert Panel

We convened a panel of experts in mental health treatment-seeking and mental health in the military (see Appendix B for detailed expert panel methods, including a list of participants). Experts were chosen based on their research expertise (i.e., published scientific research on mental health treatment-seeking) and practice-based expertise (i.e., experience running a large organization that provides mental health or support services to service members and families). The expert panel met via teleconference to review our framework and discuss types of barriers generated from the literature, feedback from military fellows, and one-on-one interviews. After this meeting, each expert received a list of approximately half of the unique items (either 117 or 118 items) and the list of barriers. Experts rated the items on these two lists for validity ("How well does each represent an actual barrier to care?") and importance ("How strongly does each influence help-seeking?"). A nine-point Likert scale was used for each rating. We held a second teleconference meeting with the expert panel to discuss the ratings, particularly those on which the experts' ratings disagreed. After the second teleconference, experts were asked to again rate any barriers or items that lacked consensus. These ratings were used to eliminate items that either scored lower than an average of 7 on both importance and validity or that received a rating below 3 on either importance or validity from two or more experts.

As a result of the expert panel, we removed items related to moral or religious beliefs (e.g., "If I had mental health problems, receiving treatment from my regular doctor would conflict with my religious beliefs") because the experts did not perceive these beliefs as important barriers to care for military populations. Specifically, the panel said that there were few religions that prohibit members from receiving professional medical care (e.g., members of the Followers of Christ [Committee on Bioethics, 2013]), and few service members are affiliated with these religions. However, we did capture beliefs about spiritual care through questions about preferences for nonprofessional care (e.g., "If I had mental health problems, a minister or pastor would help me more than a professional counselor would"). We also incorporated six items focused on facilitators of care (e.g., items about having social support for seeking treatment) and expanded one item to three items so that the wording varied by a specific mental health disorder (i.e., PTSD or depression). One item used the generic wording of "mental health problem"; the other two items referenced PTSD and depression.

The interviews and expert feedback were considered together to finalize the preliminary item pool (n = 131 items), including the question stems. In total, we elimi-

nated 115 items and added 11 to the list of unique items identified through the literature review. The term *mental health*, rather than the more-technical terms *psychological health* or *behavioral health*, was selected for question stems because experts and interviewees considered it to be the clearest and most easily recognizable term.

Field Test of Preliminary Item Pool

The final set of items comprised the preliminary item pool, which we then field-tested using a randomized block design with 3,676 active-duty service members in the Air Force, Army, Marine Corps, and Navy at military installations around the United States (see Table 1.1 for characteristics of field-test respondents). Installations that delivered occupational training courses to service members were targeted because they offered a convenient way to conduct targeted recruitment of service members from across the country in a single location. Specific installations were selected based on the relative advantage of location (to minimize costs of survey administration), availability to conduct the survey (based on recommendations and responses from installation leadership), and occupational training class size (the larger the survey pool at the location, the better). Because of this recruitment strategy (see Appendix C for more details), the participants in our sample were, on average, in higher pay grades and slightly older (relative to available data on the demographics of individuals in each service [Office of the Deputy Secretary of Defense, 2014]). However, because the primary purpose of our study design was to develop the item bank, we focused on recruiting across key subgroups (by gender, race/ethnicity, relationship status, service branch, component, officer versus enlisted status, deployment history, level of education) to obtain a sample size of at least 200 in each subgroup, rather than trying to achieve a representative sample. We needed at least 200 participants in each subgroup to establish how well each item in the bank functioned across these subgroups.

To administer all 131 items with minimal burden to respondents (i.e., each respondent getting a maximum of 100 items), we divided items into four mutually exclusive blocks and then created four test forms, each containing a different set of three blocks (i.e., Form 1 has blocks 1–3; Form 2 has blocks 2–4; Form 3 has blocks 1, 2, and 4; Form 4 has blocks 1, 3, and 4). In addition to items about barriers, the test form included measures of respondent characteristics (e.g., demographics, deployment history, past experience with mental health care), as well as existing questionnaires that assess similar constructs (e.g., a scale of perceived stigma and barriers to care for psychological problems [Britt et al., 2008]; a scale of perceived barriers to seeking mental health services [Hoge, Castro, et al., 2004]; and two subscales from the Male Role Norms Inventory Short Form [Levant, Hall, and Rankin, 2013]). Respondents completed the test form in approximately 15 to 20 minutes. Surveys were anonymous, as names or other personal identifiers were not collected. RAND study team members administered the survey at participating installations and mailed completed surveys to RAND's Survey Research Group to be entered into a database for analysis.

Table 1.1
Characteristics of Field-Test Respondents

Characteristic	Air Force (*n* = 1,129)	Army (*n* = 1,127)	Marine Corps (*n* = 863)	Navy (*n* = 557)
Pay grade				
E-1–E-3	0.62%	21.82%	0.00%	8.63%
E-4–E-6	28.11%	29.96%	39.63%	33.45%
E-7–E-9 or W-1–W-5	32.21%	17.89%	23.52%	41.37%
O-1–O-3	23.58%	15.74%	17.50%	3.78%
O-4 or higher	15.48%	14.58%	19.35%	12.77%
Age (in years)[a]	34.54 (5.25)	32.64 (9.35)	32.75 (5.52)	33.50 (7.68)
Female	18.87%	9.80%	6.53%	16.06%
Race/ethnicity[b]				
Hispanic	9.56%	11.63%	15.87%	13.82%
Black	10.7%	10.82%	8.71%	16.31%
White	73.67%	70.39%	68.85%	57.77%
Asian	0.95%	3.40%	1.91%	4.61%
Mixed	5.11%	3.76%	4.65%	7.49%
Ever deployed (includes combat and other deployments)	84.25%	74.22%	93.98%	83.74%
Education				
High school or GED	1.17%	20.18%	20.65%	18.56%
<4 years of college or less	52.47%	55.81%	59.16%	64.69%
>4 years of college	46.37%	24.00%	20.19%	16.76%
Relationship status				
Single	20.36%	35.66%	17.01%	31.70%
Married	77.84%	62.55%	82.05%	65.94%
Not married but living with partner	1.80%	1.79%	0.93%	2.37%

Table 1.1—Continued

Characteristic	Air Force (*n* = 1,129)	Army (*n* = 1,127)	Marine Corps (*n* = 863)	Navy (*n* = 557)
Experience with the mental health system				
Been diagnosed with a mental health problem[c]	9.65%	11.71%	10.54%	7.72%
Been in treatment for a mental health problem	13.20%	13.84%	13.79%	9.16%
Family member or loved one has or had a mental health problem	33.22%	30.70%	31.52%	34.65%
Caregiver of someone with a mental health problem	2.83%	2.57%	1.51%	1.97%
Mental health provider	1.06%	0.80%	0.00%	0.36%
Know someone with a mental health problem	40.83%	41.44%	41.25%	38.78%

NOTE: These percentages are column percentages that represent each category within each service.

[a] These numbers are means, with standard deviations in parentheses.

[b] Respondents categorized as black, white, Asian, or mixed are non-Hispanic.

[c] *Mental health problem* was defined for respondents as feelings of depression or anxiety that are getting in the way of a person's ability to cope with everyday life.

Analysis to Generate Item Bank

To generate the final 54-item barriers bank, six-item facilitators bank, and 15-item barriers short form, we conducted a series of statistical analyses using the data collected during the field test. These analyses included factor analysis (exploratory and confirmatory) and item analyses (i.e., an item response theory [IRT]–based approach to differential item functioning [DIF] evaluation). A brief description of these methods can be found in Chapter Four, and a detailed account of the methods is described in Appendix D.

Interviews to Generate Options for Using the Item Banks

We asked 20 experts to provide their advice to DoD on the best possible uses for the item banks. The experts were from DoD-affiliated entities running large surveys of military personnel; from agencies currently running population-level mental health-related surveys of civilians, service members, or veterans; or possessing extensive experience with military mental health or mental health survey methodology. Specifically, we asked experts to describe what works well and what pitfalls to avoid related to

- **data collection**: sampling approaches, modes of administration (e.g., Internet, phone), frequency of administration, confidentiality and privacy considerations, and nonresponse considerations
- **system design**:[2] type of system needed (surveillance versus rapid response), process for updating the system, and benchmarking considerations
- **sharing results**: relevant internal and external audiences, best modes for dissemination.

Experts shared their suggestions in a 45-minute phone interview with a RAND researcher. A research assistant took notes during the interviews to use for analysis. Two researchers conducted constant comparative analysis of the interview data (Glaser and Strauss, 1965). First, researchers read through all interview notes and developed a coding scheme to capture crosscutting suggestions that emerged during interviews. To assess the level of consistency between coders, a sample of three sets of interview notes were each coded by the researchers. Intraclass correlation was found to be 0.87, demonstrating a high degree of reliability among researchers. Themes were organized by each research question and were used to develop the options on how DoD could use the item banks. Note that frequencies and saliencies were not calculated because protocols were tailored for each interview, so specific questions and prompts differed. However, all options were mentioned by at least two of the interviewees.

Organization of This Report

Chapter Two of this report describes our framework of barriers to and facilitators of mental health care, which outlines the crucial points at which these factors might influence a service member's decision to seek mental health care. Chapter Three provides some background on prior approaches to measuring barriers to care. Chapter Four describes the RAND barriers and facilitators item banks, how these banks align with our framework, and how prior approaches to measurement compare. Chapter Five summarizes options for how DoD can use the barriers and facilitators item banks. Appendixes A through E provide more detail on the methods described above. Specifically, Appendix A describes the methods used to identify existing measures and develop a conceptual framework. Appendix B describes the methods used to narrow down the measures to a manageable list for field-testing. The methods for the field test of the preliminary item pool and the analysis of the field test to create the final item bank are described in Appendix C and Appendix D, respectively. Appendix E describes the methods used to develop options for using the item bank.

[2] For the purposes of this report, we define *system design* as the technology and substantive design considerations related to the analysis and interpretation of data on service members' barriers to mental health care.

CHAPTER TWO

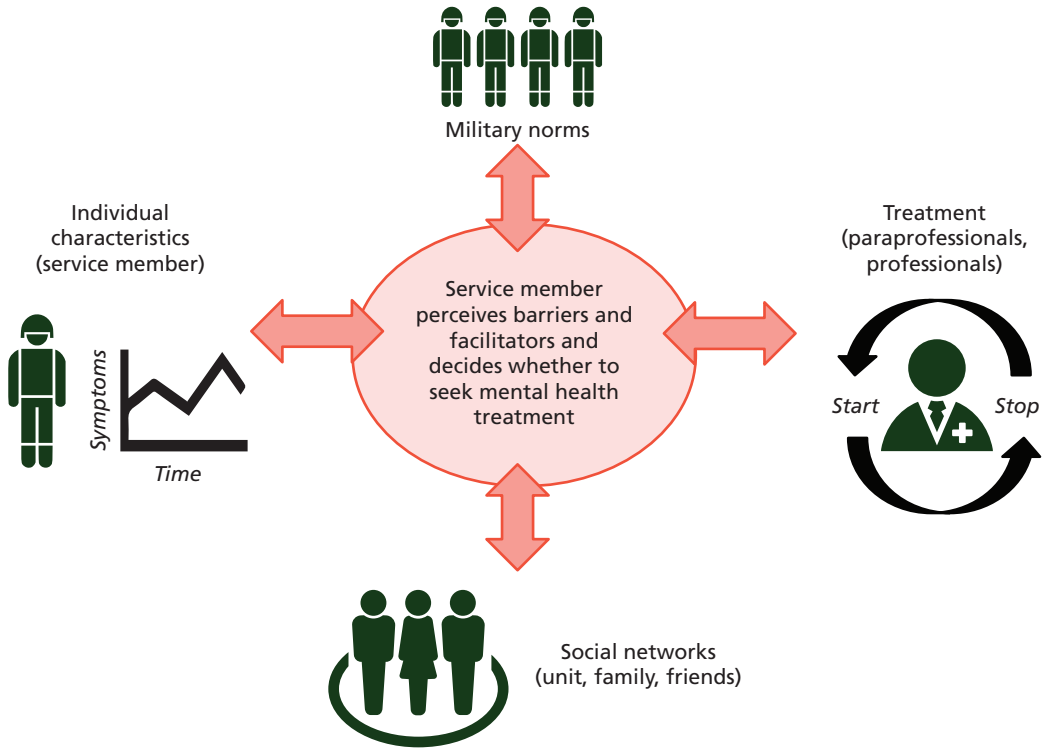
Conceptual Model of Influences on a Service Member's Decision to Seek Mental Health Care

We constructed a framework to guide the development of the item banks (Figure 2.1) through our literature review and further refined it based on feedback from RAND military fellows, one-on-one interviews, and the expert panel. We took into account prior theoretical and conceptual models and frameworks (Table 2.1), as well as systems dynamics models for public health (Luke and Stamatakis, 2012), which may be particularly useful for mapping out the complex, iterative, and dynamic process of care-seeking that has yet to be developed for mental health systems. Detailed methods used to develop our framework can be found in Appendix A.

While the existing models all acknowledged the importance of social norms and individual perceptions and attributes, the approaches taken by each model varied. For example, the Health Belief Model and Theory of Planned Behavior are based on the assumption that decisionmaking is rational and based on available information. The adapted Social Ecological Model acknowledges the importance of the interplay between structural and social factors. The Gateway Provider Model suggests that social networks, professionals, and paraprofessionals play an important facilitating role. The Network-Episode Model also acknowledges the importance of social networks but takes into account the illness career (i.e., the onset of symptoms and course of mental illness including remission, relapse, and recovery). Because there was no widely agreed upon single model that strongly predicted mental health treatment-seeking, we developed a conceptual framework to ensure that key spheres of influence over service members' decisions to seek care were included (Figure 2.1).

Because the key purpose of the our conceptual framework was to ensure that the item bank covered influential barriers to and facilitators of care (not contribute to the development of theory), the framework was based on the premise that key influences affect individuals' decisions to seek care. These influences were those covered in the aforementioned models: individual characteristics (e.g., general approach to seeking help for any problem), social networks (i.e., friends, family, unit), treatment (e.g., access, concerns about confidentiality), and military norms. We did not focus on the quality of mental health care or barriers that individuals may experience while receiving care

Figure 2.1
RAND Conceptual Framework Outlining Possible Influences on Service Members' Decisions to Seek Mental Health Treatment



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or the larger social, economic, and political contexts of the region or country where the individual is located. The conceptual framework was used in the development of the item bank to ensure that we had items that correspond to the barriers to and facilitators of care related to each of these influences.

The framework considers four key influences (see Table 2.2). First, barriers or facilitators may be related to **individual** characteristics (including attitudes toward and perceptions of mental health conditions and treatment), shame and blame, and an individual's general approach to help-seeking (i.e., whether the person tends to get help when sick). These individual barriers may affect how service members interpret symptoms and whether they engage in personal coping (e.g., exercise, meditation, consuming alcohol). The use of positive or negative personal coping styles could determine whether symptoms intensify and ultimately whether care is needed and sought.

Second, a person's interactions with **social networks** (friends, family, unit, and others) can increase or decrease the likelihood that the person will initially seek care, depending on the nature of these interactions. For example, a friend with a negative perception of treatment could discourage the service member from seeking help. Ser-

Table 2.1
Conceptual and Theoretical Models Depicting Barriers to Mental Health Care and Care-Seeking

Model	Brief Description	Reference
Adapted Social-Ecological Model	This model is an adaptation of the social-ecological framework and indicates that structural, social, individual, and health-service factors all play a role in patient attrition from antiretroviral therapy (treatment) for people living with HIV.	Musheke, Bond, and Merten, 2012
Framework illustrating perceived stigma and teen willingness to use mental health services	This framework indicates that, among teens, social support for emotional concerns, mental health experience, attitudes, mental health knowledge, perceived social consequences of mental health service use, and perceived barriers to mental health service use are related to perceived stigma and willingness to use mental health services.	Chandra and Minkovitz, 2007
New York State Model	This model used by New York State Office of Mental Health illustrates several barriers to and facilitators of mental health care.	New York State Office of Mental Health, 2010
Network-Episode Model	This model incorporates four components: the illness career, the social support system, the treatment system, and the social context.	Pescosolido and Boyer, 1999; Pescosolido and Boyer, 2010
Gateway Provider Model	"The Gateway Provider Model focuses on central influences that affect youths' access to treatment, i.e., the individual who first identifies a problem and sends a youth to treatment (the 'gateway provider'); and the need those individuals have for information on youth problems and relevant potential resources."	Stiffman, Pescosolido, and Cabassa, 2004, p. 189
Health Belief Model	"The [Health Belief Model] is based on the understanding that a person will take a health-related action (i.e., use condoms) if that person: 1. feels that a negative health condition (i.e., HIV) can be avoided, 2. has a positive expectation that by taking a recommended action, he/she will avoid a negative health condition (i.e., using condoms will be effective at preventing HIV), and 3. believes that he/she can successfully take a recommended health action (i.e., he/she can use condoms comfortably and with confidence)." (Glanz, Rimer, and Lewis, 2008, p. 45)	Glanz, Rimer, and Lewis, 2008; Acosta, Martin, et al., 2012
Theory of Planned Behavior	"According to the [Theory of Planned Behavior], intention is the immediate antecedent of behavior and is itself a function of attitude toward the behavior, subjective norm, and perceived behavioral control and these determinants follow, respectively, from beliefs about the behavior's likely consequences, about normative expectations of important others, and about the presence of factors that control behavioral performance." (Ajzen, 2011, p. 438)	Ajzen, 2011

Table 2.2
Content Covered in the RAND Barriers to and Facilitators of Mental Health Care Item Banks

Categories from the RAND Conceptual Framework	Final List After Input from Military Fellows, One-on-One Interviews, and Expert Panel
Barriers or facilitators related to the individual	Attitudes toward mental health care (compared with more-traditional health care)
	General approach to help-seeking
	Perceptions of the origin of mental health problems
	Internalized barriers (i.e., shame and blame)
Barriers or facilitators related to social networks (friends, family)	Attitudes toward individuals with mental health problems
	Attitudes toward mental health care
	Perception of burden to family, friends, society
	Concerns about being labeled with a mental health problem
	Concerns about career
	Public disclosure of mental health problems
	Reactions of social support network
	Social isolation and distance
Barriers or facilitators related to treatment	Concerns about the confidentiality of the care process
	Logistics of accessing care
	Perceptions of the treatment process
	Preferences for nonprofessional care (family, friend, chaplain, or others)
	Public reactions to treatment-seeking
Barriers or facilitators related to military norms	Strength
	Stoicism
	Part of a unit

vice members may also be concerned that individuals in their social network may see them differently if they seek care (e.g., as a burden, as mentally ill). A service member may reach out to their social network (i.e., friends, family, unit) for support and advice, or it may be that this social network first identifies the service member's symptoms. If service members think their family, friends, and unit will not support their decision to seek care, they may delay care seeking because of concerns that they will become socially isolated or jeopardize their career. If the service member has a negative experience with the treatment system and tells family or friends, this may also color their

perception and, in turn, their advice about whether the service member should continue seeking care.

Third, barriers or facilitators related to **treatment** can also affect service members' decision to continue or discontinue care. Service members' perceptions that their treatment will not be kept confidential may create reluctance to seek care. Logistical barriers when initiating care (e.g., difficulty finding transportation or getting an appointment) may also prevent service members from seeking care. Service members may also prefer to seek help from a family member, friend, or spiritual adviser, rather than seeking professional mental health treatment.

Finally, barriers or facilitators related to **military norms** can influence service members' decision to seek care. For example, service members may be concerned that seeking care or showing emotion would be seen as weak. Items in the bank were reviewed to ensure that they covered specific barriers or facilitators related to each these four influences.

The framework (Figure 2.1) is based on three key assumptions:

1. The development of mental health problems is a dynamic process in which symptoms can become more or less severe over time.
2. Service members can address mental health problems through a variety of strategies, including personal coping, social support networks, and paraprofessional or professional treatment.
3. The treatment process is complex (e.g., an individual can start and stop treatment many times), and many factors can affect a service member's decisions about treatment (e.g., when new stressors are introduced or chronic stressors reach a critical threshold).

Chapter Three further describes the multitude of barriers to care that have been captured through prior measures and how these barriers align with the RAND framework.

CHAPTER THREE

How Barriers to and Facilitators of Mental Health Care Have Been Measured

Several surveys have attempted to measure the effects of stigma and other barriers to care on mental health treatment-seeking in the military. Most notably, Mental Health Advisory Team reports provide one of the few consistent sources of publicly available information about stigma in the Army and, in some cases, the Marine Corps (Office of the Surgeon General, 2011). However, these reports are often only applicable to active-duty deployed personnel in those services and vary in the pay grades that are assessed (e.g., at times, only E-1 to E-4), and the measures have changed slightly over time and may not be comparable year to year. Other surveys include:

- The 2011 Department of Defense Health Related Behaviors Survey of Active Duty Military Personnel (Barlas et al., 2013), which included data collected from 39,877 active-duty members of the Air Force (32.9 percent response rate), Army (15.2 percent response rate), Marine Corps (21.3 percent response rate), and Navy (22.3 percent response rate) who were not deployed at the time of the survey. The survey recruits a representative sample, at times includes both the active and reserve components, is typically conducted every two to three years, and has been collecting data on barriers to care over time. At the time of this report, the 2014 and 2015 results were not yet publicly available.
- A 2012 study that examined barriers to help-seeking behavior among 533 Marines who attended the Combat Operational Stress Control Program (Momen, Strychacz, and Viirre, 2012).
- Navy Behavioral Health Quick Polls, which are brief, periodically administered surveys designed to capture a snapshot of Navy behavioral health-related issues. The Behavioral Health Quick Poll was administered annually from 2009 to 2012 and in 2014, with an administration planned for 2017.
- A large, population-based survey of service members previously deployed to Iraq or Afghanistan conducted by RAND researchers in 2007–2008 (Schell and Marshall, 2008). The survey was designed to create a broadly representative sample of that specific population. It targeted 24 geographic areas that were home to domestic military bases with the largest overall number of deployed personnel.

- A 2004 study that examined barriers to mental health care among members of three Army combat infantry units and one Marine Corps combat infantry unit (Hoge, Castro, et al., 2004).

A detailed discussion of these survey efforts, including a review of the item content and coverage and a comparison to civilian survey efforts, is available in Acosta, Becker, et al., 2014. However, many of these surveys do not cover the full DoD enterprise and are not fielded consistently over time, with the exception of the Health Related Behaviors Survey.

Survey Items Used to Assess Barriers to Mental Health Care

To compile a comprehensive list of the barriers to care covered in these survey efforts and prior studies, we reviewed 208 studies (quasi-experimental or correlational, experimental, literature review, and meta-analysis studies) and cataloged 123 measures of barriers to care (see Appendix B for the full list). The studies reviewed were published in 2003 or later and focused on mental health (search terms: "mental health" OR "mental illness" OR "behavioral health") and the measurement (search terms: AND "evaluat*" OR "assess*" OR "measure*") of one or more barriers to care (search terms: AND stigma OR discrimination OR "barriers to care" OR help-seeking OR "treatment seeking" OR treatment-seeking OR "care utilization" OR "treatment utilization" OR stereotypes).

Collectively, these 123 measures varied in length from one item to 58 items and had been used with civilian and military populations, as well as clinical and nonclinical populations. Most measures had some reliability or validity information reported (e.g., Cronbach's alpha [a common measure of scale reliability], correlation with a similar psychometrically valid measure for validity). Response options for the measures reviewed varied widely, but they included five-point and seven-point Likert scales (e.g., strongly agree to strongly disagree), categorical responses (e.g., once, two to three times, four to five times, more than five times), and dichotomized responses (e.g., yes/no). Our brief review of these measures revealed that barriers to care were not measured using a single standardized scale or set of response options, and they varied widely by population (e.g., clinical versus nonclinical sample) and the specific barriers being assessed (e.g., stigma versus logistical barriers).

Because the purpose of our study was to create broad-based banks of barriers to and facilitators of care, we extracted items from each measure and eliminated redundancies, narrowing down the list to content that clearly focused on a barrier to or facilitator of care. Specifically, from the cataloged 123 measures of barriers to care, we

identified 2,588 items, of which 1,607 contained content that was clear, nonredundant, and focused. Using an iterative series of sorting exercises (see Appendix B for more details), we used consensus across two researchers to group these 1,607 items into an initial list of 26 unique barriers to and facilitators of care (middle column of Table 3.1), which was further categorized and refined into a list of 20 barriers and facilitators (right column in Table 3.1) using input from the military fellows, one-on-one interviews, and expert panel. These 20 barriers and facilitators were then linked to the key influences on care-seeking related to the individual, social networks, treatment, and military norms as outlined in our framework (left column in Table 3.1). Table 3.1 shows how we progressively sorted items into barriers and facilitators. In some instances, groups of items capturing barriers or facilitators that were in the initial list were split apart or consolidated into new categories. For example, items capturing general mental health attitudes were ultimately sorted into two barriers or facilitators—attitudes toward mental health care and perceptions of the origin of mental health problems. The latter ("perceptions of the origin of mental health problems") also contains items originally sorted into "other misinformation or myths" (which was ultimately cut from the list of final barriers and facilitators).

Table 3.1
Barriers to and Facilitators of Mental Health Care Organized by Key Influences Presented in the RAND Conceptual Framework

Influences from the RAND Framework	Initial List from Literature Review of Existing Scales	Final List After Input from Military Fellows, One-on-One Interviews, and Expert Panel
Individual characteristics	General mental health attitudes[a]	Attitudes toward mental health care (compared with more-traditional health care)
	General help-seeking attitude	General approach to help-seeking
	General mental health attitudes,[a] other misinformation or myths	Perceptions of the origin of mental health problems
	Blame, shame	Internalized barriers (i.e., shame and blame)
Social networks (friends, family)	Discrimination, general mental health attitudes[a]	Attitudes toward individuals with mental health problems
	General mental health attitudes[a]	Attitudes toward mental health care
	Family stress	Perception of burden to family, friends, society
	Labeling	Concerns about being labeled with a mental health problem
	Concerns about career	Concerns about career
	Family/peer disclosure, public disclosure	Public disclosure of mental health problems
	Worthlessness,[a] family stress	Reactions of social support network
	Social distance	Social isolation and distance
Treatment	Literacy[a]	Concerns about the confidentiality of the care process
	Logistics	Logistics of accessing care
	Perceived effectiveness of treatment, medication side effects, past experiences	Perceptions of the treatment process
	Literacy,[a] perceived need	Preferences for nonprofessional care
	Worthlessness[a]	Public reactions to treatment seeking
Military norms	Self-perceived weakness	Strength
	Military norms	Stoicism, part of a unit

NOTE: We eliminated religious beliefs, which was identified in the literature review but deemed not relevant to the military population based on feedback from military fellows, one-on-one interviews, and the expert panel.

[a] These barrier and facilitator items, initially identified from the literature review of measures as a single barrier, were split across multiple barriers and facilitators in the final list.

CHAPTER FOUR

Factor Analyses, Item Analyses, and Preliminary Validity of RAND Barriers and Facilitators Banks

This chapter briefly describes the results of the factor analyses and item analyses (DIF and IRT) used to evaluate bank items based on their psychometric functioning and performance relative to the other bank items. This chapter also summarizes the two item banks (barriers bank and facilitators bank) and the short form (which was culled from the barriers bank). We conclude with a discussion of some early analyses establishing the preliminary validity of the item banks. More detailed descriptions of the analyses and findings from our factor and item analyses are contained in Appendix D.

Factor Analyses

To explore the underlying dimensionality among the items, the sample from our survey of 3,676 active-duty service members across four military branches (Air Force, Army, Marine Corps, and Navy) was randomly split into two subsamples—one to conduct exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) and another to validate final dimensionality results with CFA. Prior to factor analyses, item scores were standardized so that, for all items, higher scores were indicative of more perceived barriers to care. Four items that asked specifically about PTSD and depression were also set aside to ensure that all items were worded similarly. Although there were 20 eigenvalues greater than one from the EFA, examination of the scree plot showed that the biggest drop in eigenvalues was from one factor (51.45) to two factors (5.52), indicating the presence of an overwhelming primary factor. The remaining eigenvalues indicated the potential for up to two additional factors, as the next biggest drop was from three factors (4.81) to four factors (3.54). Based on the eigenvalues, we examined solutions for up to five factors. Our examination found that for both the four- and five-factor solutions, the fourth and fifth factors did not emerge as distinct in content, the interpretation of these factors was unclear, and there were few items that loaded strongly on them. Given the consistently strong loadings, distinct content, and clear interpretation of the pattern of factor-loadings, we elected to evaluate the three-factor solution more closely. We recognize that prior research (e.g., Britt, Greene-Shortridge,

et al., 2008) has found more-factorial distinctions among barrier items, but it has also favored a more parsimonious solution, as recommended in the literature on EFA (Thompson and Daniel, 1996).

Examination of the three-factor EFA solution led to the identification of 22 items that were not loading highly on any of the three factors. As a result, they were excluded from our subsequent analyses. We next estimated a three-factor CFA model, still using the exploratory subsample to evaluate fit of the reduced item set (number of items = 105). The fit for the three-factor CFA model was good (root mean squared error of approximation [RMSEA] = 0.04, where values less than 0.05 are considered a good fit; comparative fit index [CFI] = 0.96 and Tucker-Lewis index [TLI] = 0.96, where values greater than 0.95 indicate a good fit). A total of 76 items loaded strongly on the first factor (f1, loading range = 0.34–0.89), 19 loaded on the second factor (f2, loading range = 0.21–0.83), and ten loaded on the third factor (f3, loading range = 0.35–0.74). The correlations among the three factors were high, especially between factors 1 and 2 (r = 0.77 between f1 and f2, 0.57 between f1 and f3, and 0.59 between f2 and f3), indicating that a more parsimonious factor structure (i.e., one- or two-factor structure) might be more appropriate.

Next, we separately estimated each single factor from this three-factor solution with one-factor CFA models to further reduce the number of items. We examined item-clustering (local dependence between pairs or groups of items) for each model based on modification indices and identified 30 items from the three CFA models for removal. This procedure yielded 77 remaining items (57 for factor 1, 13 for factor 2, and seven for factor 3) to be further analyzed.

Given the high correlation among the three factors, we next specified a bifactor model (Gibbons and Hedeker, 1992) to better identify the loading patterns for the three factors and determine whether a subset of items specifically from factors 1 and 2 could be considered to comprise a single general factor. Based on results from the bifactor model, we identified 68 items from the original factors 1 and 2 that reflected overall barriers to care and were retained for the first item bank. Another seven items were kept from the original factor 3 that were seen as unique content representing the positive or protective facilitators of care.

We next confirmed the fit of these two single-factor models using the validation subsample. Results for the single general barriers-to-care factor yielded excellent fit (RMSEA = 0.05, CFI = 0.97, and TLI = 0.96).[1] For the facilitators-of-care factor, model fit was adequate, but results suggested deleting an item with overlapping content. Model fit was excellent with the remaining six items kept for the facilitators-of-care factor (RMSEA = 0.05, CFI = 0.98, and TLI = 0.96).

[1] According to Hu and Bentler (1999), an RMSEA of 0.06 to 0.10 provides a mediocre fit, and close or below 0.06 shows a good fit. A cut point of 0.95 for TLI and CFI indicates good fit. The marginal reliability (MR) coefficient is an important IRT-based measure of overall scale reliability. Generally, a value of 0.8 or higher is considered good reliability. However, a low value is expected with shorter test length.

With these two item sets as candidates for potential item banks, we fitted two unidimensional IRT models using the complete data set to separately evaluate their item characteristics for building each item bank (Appendix D provides detailed item parameter estimates). Two items that showed weak relationships with the barriers-to-care factor were further removed. These IRT calibrations led to a barriers bank with 66 items (MR = 0.99) and a smaller six-item facilitators bank (MR = 0.76).

Item Analyses

After the factor analyses were complete, we ran DIF analyses for each bank separately (see Appendix D for a detailed description of the DIF assessment procedures). DIF analyses serve to identify problematic item bias associated with membership in a particular group (e.g., gender, service branch). A classic example of DIF is crying as a symptom to measure depression level. Women may report being "often in tears" more frequently than men on a measure of depression symptoms (Romans et al., 2007). Thus, a response indicating frequent crying may indicate a more severe depression level if the respondent is male than if the respondent is female. In cases where DIF is detected, scores computed for the different groups would not be comparable, thus these items should be removed from the final item bank to ensure that the bank of items yields comparable unbiased scores for the subgroups.

For the barriers bank, we examined DIF by eight respondent characteristics: race/ethnicity (Hispanic versus white versus black), gender (females versus males), relationship status (married or living with partner versus single or living alone), education (high school or less versus some college versus four-year college or more), service branch (Army versus Air Force versus Marine Corps versus Navy), officer versus enlisted status (officer versus enlisted), component (active component versus Reserve/Guard), and deployment (ever been deployed for combat or other reasons versus not). Appendix D contains tables showing the pairwise comparisons between these eight characteristics. Because the facilitators bank contained fewer items, we were only able to examine DIF for four respondent characteristics: service branch, gender, officer versus enlisted status, and component. The goal of DIF analysis was to eliminate any item bias toward these subgroups in the final assessment tools. Because of the ordered categorical responses, we fit Samejima's (1997) Graded Response Model to the entire sample (N = 3,676). All DIF analyses were conducted with two-group model setups. For variables with more than two comparison groups, multiple pairwise comparison runs were conducted to thoroughly test for DIF within that grouping variable. For example, three pairwise models were fit to the data to test race/ethnicity DIF: (1) white versus black, (2) white versus Hispanic, and (3) black versus Hispanic.

We assessed DIF through three steps: (1) a two-stage procedure to test statistical significance of DIF; (2) quantification and visualization of severity or impact of DIF; and (3) a summary of results from the first two steps across each of the pairwise com-

parisons reflecting combined performance of each item. Items found to exhibit substantial bias based on these three steps were excluded from the final item banks. We removed 12 items from the barriers bank, leaving 54 items as candidates for the final bank. No items in the facilitators bank had problematic DIF, so none were removed.

The next step was to use IRT to calibrate the items in each bank to obtain psychometric performance information about each item (i.e., estimated item parameters). With the estimated item parameters from the calibration process, we examined typical item properties, such as the item characteristic curve[2] and item and test information functions,[3] as well as model fit. Results showed very good calibration of the barriers bank and excellent model fit (RMSEA = 0.00). The MR was 0.98 for the 54-item barriers bank, and, as shown by the dotted line in Figure 4.1, the standard error curve reflects high reliability for most scores (the lower the standard error, the higher the reliability). Standard errors tend to get bigger, and consequently less precise, toward the tails of the latent trait because of less information at the lower and higher ends.

Because of its limited number of items, the facilitators bank had a lower MR (0.76) and worse, but still acceptable, model fit (RMSEA = 0.13) relative to the barriers bank. As shown in Figure 4.2, the standard error (dotted line) is higher, and therefore reliability is lower for the facilitators bank than that observed for the barriers bank.

Barriers to Mental Health Care Item Bank (54 Items)

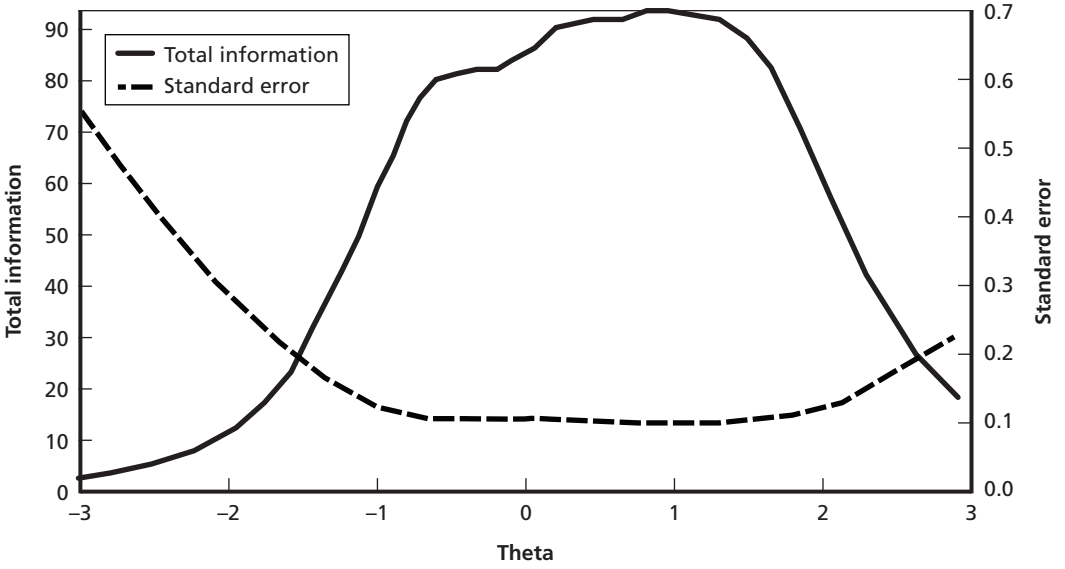
Based on the factor and item analyses, we selected 54 items for the barriers bank. This item bank conceptually captures barriers that may be preventing service members from seeking care. Respondents are instructed to "indicate the extent to which they agree with each statement. When we refer to *mental health problems*, we mean feelings of depression or anxiety that are getting in the way of your ability to cope with everyday life. When we refer to *professional help*, we mean mental health treatment from a health care provider, counselor, psychiatrist, or psychologist." Response options for these items are: not at all, a little bit, somewhat, quite a bit, and very much. Higher scores reflect more barriers to care.

Table 4.1 contains the item (wording and unique number to allow tracking across report tables) and several indicators of DIF. As previously mentioned, we calculated DIF across eight respondent characteristics (race/ethnicity, gender, relationship status,

[2] An item characteristic curve examines the performance of an item by assessing the probability that a respondent will answer an item a specific way, given certain characteristics (e.g., gender). These probabilities are plotted and plots are reviewed to determine how effectively the item discriminates between respondents that are on the high and low ends of the continuum of the construct being measured (Edelen and Reeve, 2007).

[3] Item information function further examines the performance of the item by assessing the precision of the information provided by the item characteristic curve. For example, if all respondents answer an item similarly, the item does not help us precisely define the two ends of the continuum (Edelen and Reeve, 2007).

Figure 4.1
Test Information Curve for the Barriers to Mental Health Care Bank with 54 Items



NOTES: Standard error curve indicates less precision at the tails of the latent continuum. Item information represents the discrimination power provided by the item at different levels of the latent trait (i.e., theta). Test information curve summarizes the total information provided by a test, which is the sum of all the item information within the test. The opposite of the test information is depicted by the standard error curve to indicate precision of measurement of the whole test at each level of theta. Standard error of measurement is at the lowest where the test information is at the highest. It tends to go higher, indicating less precision toward the tails of the latent continuum.

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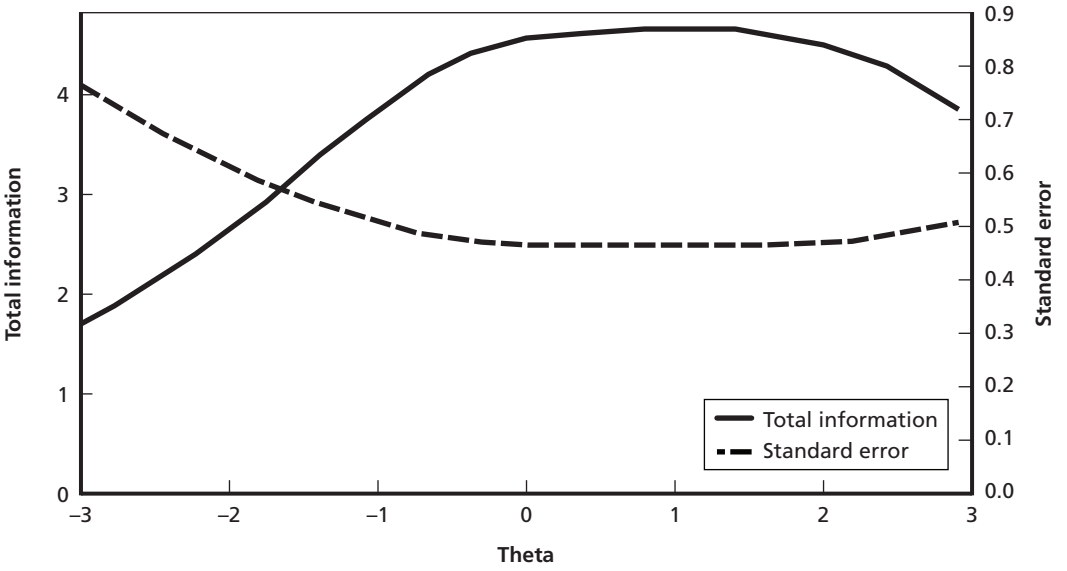
education, service branch, officer versus enlisted status, component, and deployment for a total of 17 pairwise comparisons). These indicators of DIF in Table 4.1 are: (1) maximum weighted Area Between the expected score Curves (wABC) value across the DIF analyses for all eight characteristics; (2) the number of wABC values greater than 0.3 across the DIF analyses; and (3) the total number of statistically significant differences based on the Wald Chi-square calculated as part of our DIF analysis. Although there was no clear rule of thumb regarding the cut point for wABC, these numeric values provided quantifiable information to help identify problematic items. The sample size was very large, potentially making very small differences statistically significant.

Facilitators of Mental Health Care Item Bank (Six Items)

Based on the factor and item analyses, we selected six items for the facilitators bank (Table 4.2). This item bank conceptually captures facilitators that may support and encourage service members to seek care. Instructions for respondents and response

Figure 4.2
Test Information Curve for the Facilitators of Mental Health Care Bank with Six Items



NOTES: Standard error curve indicate less precision at the tails of the latent continuum. Item information represents the discrimination power provided by the item at different levels of the latent trait (i.e., theta). Test information curve summarizes the total information provided by a test, which is the sum of all the item information within the test. The opposite of the test information is depicted by the standard error curve to indicate precision of measurement of the whole test at each level of theta. Standard error of measurement is at the lowest where the test information is at the highest. It tends to go higher, indicating less precision toward the tails of the latent continuum.

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options for these items are the same as for the barriers bank: not at all, a little bit, somewhat, quite a bit, and very much. We reverse-scored these items to ensure a similar direction to the barriers bank (higher scores represent fewer facilitators).

Barriers to Mental Health Care Short Form (15 Items)

The barriers short form is useful to reduce respondent burden and avoid having to field the item bank in its entirety. To create the barriers short form, we considered both item performance (based on the previously described IRT analyses) and content coverage. Because the facilitators bank was just six items, no short form was needed. We created a form with no more than 15 items that reflected the items with the strongest properties in each of the barrier categories (military norms, social networks, individual attributes, and treatment). Table 4.3 shows the content coverage of the 15 items selected for the short form.

Table 4.1
Summary of Differential Item Functioning for the 54 Items in the Barriers to Mental Health Care Bank, by Respondent Characteristics of Service Branch, Race/Ethnicity, Education, Gender, Relationship Status, Officer Versus Enlisted Status, Deployment, and Component

Item Number[a]	Item Wording	Max wABC Value[b]	Count wABC > 0.3[b]	Count $p <$ 0.01
BTC111	If I were diagnosed with a mental health problem, I would feel stigmatized.	0.4	2	5
BTC75	If I were having mental health problems, I would feel that I was a burden on my family or friends.	0.37	1	4
BTC97	If I were getting help from a mental health provider, my peers would think less of me.	0.37	2	4
BTC127	If I had mental health problems, I would be uncomfortable seeking professional help because people might find out about it.	0.36	2	4
BTC56	If I sought professional help for mental health problems, I would be worried that others will view me unfavorably.	0.35	1	7
BTC105	If I had mental health problems, I would be reluctant to seek professional help.	0.35	1	7
BTC118	If I had mental health problems, people would feel unsafe around me.	0.35	1	7
BTC2	If I were receiving mental health treatment and my unit knew about it, they would think I was unreliable.	0.34	1	3
BTC14	It would be risky to reveal that I had sought professional help for mental health problems on my security clearance application.	0.34	1	2
BTC73	If I had a mental health problem, I would not want to receive mental health treatment because of being afraid of what others might think.	0.32	2	5
BTC96	If I had mental health problems, I would be unable to contribute anything to society because of my problems.	0.32	1	7
BTC16	Concern that I might be seen as "crazy" would discourage me from seeking professional care for mental health problems.	0.31	1	3
BTC110	If I had mental health problems, people would see me as inferior.	0.3	1	4
BTC42	Physical disabilities seem more deserving of care than mental health problems.	0.29	0	5
BTC83	If I had mental health problems and asked for professional help, I would be admitting that my coping skills were inadequate.	0.29	0	4
BTC126	If I were having mental health problems, other service members would respect my opinions less.	0.29	0	4

Table 4.1—Continued

Item Number[a]	Item Wording	Max wABC Value[b]	Count wABC > 0.3[b]	Count $p <$ 0.01
BTC131	If my chain of command discovered I was seeking professional help for mental health problems, I would lose their respect.	0.29	0	3
BTC21	If I had mental health problems, I would not seek professional help because treatment does not work.	0.28	0	5
BTC81	If I sought professional help for mental health problems, I am afraid that my chain of command would find out what I told the mental health provider.	0.28	0	5
BTC19	If I were to receive mental health treatment, I might be prescribed medicine that would interfere with my ability to do my job.	0.27	0	2
BTC68	If I had mental health problems, members of my unit would have less confidence in me.	0.27	0	4
BTC71	If I had mental health problems, people would feel awkward and tense when around me.	0.27	0	3
BTC85	If I were having mental health problems, I would keep it to myself to avoid being labeled as a person with mental illness.	0.27	0	3
BTC50	I would see myself as weak if I had mental health problems and could not fix them myself.	0.26	0	5
BTC74	Having been diagnosed with a mental health problem would be a blemish on my military record.	0.26	0	3
BTC80	If I had mental health problems, people would treat me like a child.	0.26	0	3
BTC104	People would avoid talking to me if I had mental health problems.	0.26	0	5
BTC109	If I had mental health problems, concern that I might be seen as weak would discourage me from getting professional care.	0.26	0	3
BTC116	People with mental health problems cannot control their emotions.	0.26	0	6
BTC128	If I had mental health problems, I would be seen as cowardly.	0.26	0	5
BTC11	I would be given less responsibility if my chain of command knew I was seeking professional help for mental health problems.	0.24	0	3
BTC65	I would avoid social situations because of my mental health problems.	0.24	0	3
BTC88	I would be taken less seriously if I had mental health problems.	0.24	0	5

Table 4.1—Continued

Item Number[a]	Item Wording	Max wABC Value[b]	Count wABC > 0.3[b]	Count $p <$ 0.01
BTC106	If I had mental health problems, I would not seek treatment because it would take time away from serving my unit.	0.24	0	1
BTC124	If I had mental health problems, I would feel set apart from others who did not.	0.24	0	1
BTC13	If I had mental health problems, getting mental health treatment would be a last resort.	0.23	0	6
BTC30	If I were having mental health problems, being concerned that it might bring shame or disapproval on my family would be a barrier to professional care.	0.23	0	6
BTC78	If I had mental health problems, it would be viewed as a sign of personal failure.	0.23	0	2
BTC108	People would not want to be my friend if I had mental health problems.	0.23	0	2
BTC115	If I had mental health problems, people would treat me like an outcast.	0.23	0	4
BTC119	It is best to avoid people with mental health problems, in order to avoid having a mental health problem yourself.	0.23	0	4
BTC57	I would not seek professional help for mental health problems because I would have to give too much personal information to the counselor.	0.22	0	1
BTC58	If I sought mental health treatment, I would be seen as weak.	0.22	0	5
BTC60	If I were suffering from mental health problems, I would feel responsible for my problems.	0.22	0	1
BTC7	People would stop calling me after learning I had mental health problems.	0.2	0	1
BTC17	If I had mental health problems, my friends or family members would think less highly of me.	0.2	0	2
BTC43	Mental health problems are a sign of personal weakness.	0.2	0	6
BTC103	If I had a mental health problem, other service members would not be very tolerant of my problems.	0.2	0	4
BTC121	If I had a mental health problem, I would be afraid that my peers would find out what I tell my mental health provider.	0.2	0	2
BTC36	If I had mental health problems, I would be seen as weak.	0.19	0	6
BTC44	If I had mental health problems, people would not give me any responsibility.	0.19	0	3

Table 4.1—Continued

Item Number[a]	Item Wording	Max wABC Value[b]	Count wABC > 0.3[b]	Count $p <$ 0.01
BTC52	If I had mental health problems, people would be uncomfortable around me.	0.17	0	3
BTC117	I would not be respected if I talked about my worries, fears, and problems.	0.16	0	1
BTC47	If I had a mental health problem, I would lose friends by telling them.	0.15	0	2

NOTE: BTC = barrier to care.

[a] Item number was a unique identification number created for each item we field-tested (ranging from BTC1 to BTC131). We included the tables in this report to allow readers to track items, without having to compare wording.

[b] The wABC is an index representing the weighted (by the normal distribution) area between the two IRT-based item characteristic curves. It can be used to characterize the extent of discrepancy between two curves because of DIF. Larger wABC values indicate a higher degree of DIF. We assessed wABC for each of the eight respondent characteristics. This table summarizes across these analyses. The max wABC value is the max value across the DIF analyses for all eight characteristics. The count wABC > 0.3 is the number of wABC values that were greater than 0.3 across the DIF analyses. The count of $p < 0.01$ was the total number of statistically significant differences based on the Wald Chi-square calculated as part of our DIF analysis.

To facilitate short-form scoring, a summed score to IRT scale score transformation table was generated (see Appendix D). This allows users to compare the summed score from the barriers short form with the summed score from the full barriers bank. When multiple forms are created to reduce user fatigue, these sum-to-scale score transformations will allow equivalent comparisons between forms of different length and with different items.

Preliminary Validity Analyses

To examine the preliminary validity of the item banks, we compared the item bank scores with three existing established measures of similar constructs (two measures of barriers to care and one of male role norms). We hypothesized that the correlation with the barriers to and facilitators of care would be high given the content overlap, and the correlation with the male role norms scale would be moderate given that the majority of our sample is male. As a reminder, the facilitators bank was reverse-scored, so higher scores mean fewer facilitators.

We also examined differences in response patterns by demographics, experience with the mental health system, and general help-seeking behaviors. With the IRT approach, we expected to see minor or no group differences in terms of barriers bank or short-form scores because of age, gender, race/ethnicity, education, service branch,

Table 4.2
Summary of Differential Item Functioning for the Six Items in the Facilitators of Mental Health Care Bank, by Service, Gender, Officer Versus Enlisted Status, and Component

Item Number[a]	Item Wording	Max wABC Value[b]	Count wABC > 0.3[b]	Count $p < 0.01$[b]
BTC33	It is possible for people with mental health problems to recover.	0.16	0	0
BTC46	If I had mental health problems, it would be easy for me to find the time to see a professional for those problems.	0.31	1	1
BTC49	People that I am close to would support me in seeking mental health treatment.	0.13	0	0
BTC114	If I had mental health problems, I would be comfortable talking about them with a counselor or professional.	0	0	0
BTC122	If friends learned that I received treatment for mental health problems, they would be supportive and understanding.	0.12	0	0
BTC129	If I had mental health problems, I would receive good professional care from the military.	0.22	0	0

[a] Item number was a unique identification number created for each item we field-tested (ranging from BTC1 to BTC131). We included the tables in this report to allow readers to track items, without having to compare wording.

[b] The wABC is an index representing the weighted (by the normal distribution) area between the two IRT-based item characteristic curves. It can be used to characterize the extent of discrepancy between two curves because of DIF. Larger wABC values indicate a higher degree of DIF. Items with significant DIF were those items with two or more wABC values greater than 0.3 (as reflected in the column Count wABC > 0.03 or items with more than seven significant DIF scores, as reflected in the column count $p < 0.01$).

component, or experience with mental health system. However, we did expect to see some differences in these characteristics for the existing established measures. Consistent with past research, we expected bank scores to be higher from respondents exhibiting PTSD or depression symptoms.

We also examined response patterns to wording for a single item referencing two specific disorders (PTSD and depression) compared with the same item referencing a "mental health problem." This was an exploratory analysis to help DoD determine whether response patterns might differ if the general wording used in the item bank were tailored to a specific disorder.

Comparisons to Existing Established Measures

We first looked at the correlations among the barriers bank score (54 items) and the short-form score (15 items from the barriers bank), the facilitators bank score, two widely utilized barriers to care scales among military populations (Britt, Greene-Shortridge, et al., 2008; Hoge, Castro, et al., 2004), and an established scale of male norms (Levant, Hall, and Rankin, 2013). The scale of male norms was selected because

Table 4.3
Content Covered by the 15-Item Barriers to Mental Health Care Short Form

Categories of Barriers	Specific Barrier	Short-Form Item	Item Number
Barriers related to military norms	Stoicism	I would not be respected if I talked about my worries, fears, and problems.	BTC117
	Strength	If I sought mental health treatment, I would be seen as weak.	BTC58
Barriers related to social networks	Perception of burden to family and friends	If I were having mental health problems, I would feel that I was a burden on my family or friends.	BTC75
	Concerns about career	I would be given less responsibility if my chain of command knew I was seeking professional help for mental health problems.	BTC11
	Concerns about career	If I had mental health problems, members of my unit would have less confidence in me.	BTC68
	Reactions of social support network	If I was getting help from a mental health provider, my peers would think less of me.	BTC97
	Attitudes toward individuals with mental health problems	If I were diagnosed with a mental health problem, I would feel stigmatized.	BTC111
	Social isolation and distance	If I had mental health problems, people would feel awkward and tense when around me.	BTC71
	Social isolation and distance	I would be taken less seriously if I had mental health problems.	BTC71
Barriers related to treatment	Perceptions of the treatment process	If I had mental health problems, I would not seek professional help because treatment does not work.	BTC21
	Logistics of seeking care	If I had mental health problems, I would not seek treatment because it would take time away from serving my unit.	BTC106
	Concerns about the confidentiality of the care process	If I had mental health problems, I would be uncomfortable seeking professional help because people might find out about it.	BTC127
	Public reactions to treatment-seeking	If I had a mental health problem, other service members would not be very tolerant of my problems.	BTC103
Barriers related to the individual	Internalized barriers (shame and blame)	If I had mental health problems, it would be viewed as a sign of personal failure.	BTC78
	Internalized barriers (shame and blame)	If I were suffering from mental health problems, I would feel responsible for my problems.	BTC60

the items closely aligned with military norms (e.g., strength, stoicism). We found that the facilitators bank score was moderately correlated with the barriers scores (0.5 with the 54-item bank score and 0.48 with the 15-item short-form score), indicating that the facilitators bank was measuring unique aspects of barriers to care that were not covered by the barriers items. As hypothesized, correlations between the barriers bank score and the two barriers to care scales were high (0.76 with the Britt scale, 0.78 with the Hoge scale), indicating good convergent validity of the barriers bank. The barriers bank score correlated moderately with the male norms scale (0.40), suggesting that male norms, such as independence and stoicism, may only be a part of the overall barriers to care. The barriers short-form score also correlated with the three additional scales in a similar fashion (0.74 with the Britt scale, 0.76 with the Hoge scale, and 0.40 with the male norms scale). Correlations between the facilitators bank score and the three additional scales were moderate to low (0.50 with the Britt scale, 0.56 with the Hoge scale, and 0.30 with the male norms scale), suggesting that facilitators overlap with but are still distinct from barriers.

Examining Demographic Variation

We then conducted *t*-tests and regression analyses to evaluate differences in item bank and short-form scores for the two banks that were due to age, gender, race/ethnicity, education, officer versus enlisted status, service branch, component, experience with mental health system, and symptoms of PTSD and depression. We found no difference in these scores according to age, gender, and component (active component versus Reserve/Guard). Our results did find that black non-Hispanic respondents (compared with whites non-Hispanics and Hispanics) consistently had lower scores on the barriers items (using both the 54-item bank and the short form), facilitators items and the two subscales of the Male Role Norms Inventory—suggesting they had lower barriers, more facilitators, and endorsed fewer of the male norms. Research has also found that black service members have a lower risk for PTSD (Ramchand et al., 2015). Service members exhibiting symptoms are more likely to endorse barriers (Clement, Schauman, et al., 2015). This lower risk among black service members may help explain, in part, why they consistently endorse fewer barriers.

For the barriers bank and short form, we found no statistical difference by education or service branch. However, for the facilitators bank and the three established scales, we did observe statistically significant differences among these subgroups for different levels of education and different service branches. Specifically, service members without a four-year college degree reported fewer facilitators and more barriers than those with four years of college or more using both the Britt and Hoge scales. Similarly, service members without a four-year college degree endorsed significantly more male norms. Findings by service branch were more variable. Marines reported significantly fewer facilitators of care than sailors. Using the Britt scale, service members in the Army and Navy reported significantly more barriers than service members

in the Air Force; however, this same difference was not found using the Hoge scale. Sailors endorsed significantly more male norms than soldiers or marines and airmen endorsed significantly fewer male norms than the other three service branches. For the facilitators bank, we found no significant difference between officers and enlisted. However, for the barriers bank and short form, we found that officers reported significantly more barriers than enlisted did. This is consistent with past research (Hernandez, Bedrick, and Parshall, 2014).

Examining Differences Based on Experiences with the Mental Health System

Experience with the mental health system (e.g., past history with mental health treatment, past diagnosis with a mental health problem) can also influence perceptions of barriers to care. We found that people exhibiting symptoms of PTSD or depression all had significantly higher barriers bank and short-form scores than those without such symptoms. This is consistent with past research on military populations that has found that those with mental health problems report feeling more stigmatized (Clement, Schauman, et al., 2015). No such differences were found for the facilitators items.

We also assessed how the items were related to service members' experiences with mental health problems or treatment. Results showed significantly higher barriers bank and short-form scores among service members who had previously been diagnosed with a mental health condition versus those with no such prior diagnosis, but again no such difference was observed with the facilitators items.

We found no statistically significant differences on barriers bank or short-form scores or facilitators bank scores among service members who reported having been in treatment, having a family member or knowing someone with a mental health problem, being a caregiver for someone with a mental health problem, or being a mental health provider compared with service members who had no reported experience with mental health problems or treatment.

Examining Differences by Preferences for Nonprofessional Care

Service members' stronger preference for family or friends instead of professionals was significantly correlated with barriers bank and short-form scores (0.24 with the bank score and 0.23 with the short-form score) and had a near-zero correlation with the facilitators items (0.06 with the scale score). Although the correlations with the barriers bank and short-form scores were small, these findings suggest that service members who reported a stronger preference for family or friends over professionals also reported slightly more barriers to care, which is consistent with prior research that found this preference to be a predictor of treatment-seeking (Acosta, Becker, et al., 2014; Adler et al., 2015).

Summary of Findings on Preliminary Validity

Our preliminary validity analyses suggested that the barriers bank and short form are valid ways to measure barriers to care. As hypothesized, we found a strong correlation between the barriers bank (total score and short-form score) and the two existing barriers to care scales, suggesting convergent validity. Correlations between the facilitators bank score and the three additional scales were moderate to low (0.50 with the Britt scale, 0.56 with the Hoge scale, and 0.30 with the Male Role Norms Inventory subscales). As expected, we also saw minor or no group difference in terms of barriers bank or short-form scores because of age, gender, race/ethnicity, education, service branch, or component, but we did expect to see some differences in these characteristics for the existing established measures. This suggests that the barriers bank may provide some additional precision of measurement across populations over and above prior measures. Consistent with past research, we found the bank scores and scores from existing measures from respondents exhibiting PTSD or depression symptoms and from respondents who have been diagnosed with a mental health disorder reflect greater barriers to care. In addition, we found that service members who reported a stronger preference for family or friends (over professionals) also reported slightly more barriers to care, which is consistent with prior research that found this preference to be a predictor of treatment-seeking (Acosta, Becker, et al., 2014).

The facilitators bank moderately correlated with the barriers bank, indicating it was measuring a potentially unique type of construct related to help-seeking. Preliminary validity analyses did not confirm whether these items were valid, and we did not have a preexisting facilitators of care scale to compare with these items.

Examining Differences in General Versus Disorder-Specific Items

In addition to these validity analyses, we wanted to answer the question: Would changing the language of items from general mental health problems to specific mental health disorders influence the item properties?

To assess differences in the performance of disorder-specific versus general items, we examined the impact of the two items that referenced PTSD and depression specifically (instead of the phrase "mental health problem") by replacing the corresponding general item with each disorder-specific item in the IRT calibration and bank scoring. This allowed us to see the extent to which the item and scale properties might change when the disorder-specific version of an item is used. Our results showed that using either one of the specific items would cause changes in the barriers bank score among subgroups (e.g., different gender and education levels)—differences that were not observed previously when using the general item.

These findings suggest that service members' endorsement of barriers to care may vary if they are asked about a specific disorder instead of general mental health prob-

lems. Therefore, if DoD changes the language of bank items from general to disorder-specific, it will change the item properties and potentially negatively influence their ability to accurately capture barriers across the military population. A disorder-specific item bank would need to be created if there were a desire to learn more about specific disorders.

CHAPTER FIVE

How DoD Can Use the RAND Barriers to and Facilitators of Mental Health Care Item Banks

We developed a 54-item barriers bank and a six-item facilitators bank to help DoD improve its measurement of barriers to and facilitators of mental health help-seeking behavior. This chapter summarizes options for how DoD can utilize the item banks to assess and monitor barriers to and facilitators of care, assess the results of practice or policy interventions to address barriers, and maintain the banks' relevance. To inform these options, we sought input from 20 experts, including a working group of DoD staff. Appendix E contains detailed methods for eliciting and synthesizing their suggestions, as well as a list of the participating experts.

Options for Utilizing the RAND Item Banks

We identified four options for DoD to consider in utilizing the item banks. The first three focus on using the item banks as part of enterprisewide data collection or evaluation of interventions to reduce barriers to care. The fourth focuses on a more staged approach that allows for a smaller-scale pilot test(s) of the item banks prior to any enterprisewide utilization. For each option, we provide a brief description and include specific questions that the approach could answer. If data collection across the military is required, DoD could consider leveraging existing survey efforts by embedding bank items into an ongoing survey. In particular, the Health Related Behaviors Survey may be a potential place to field items from the banks because it is collected every two to three years, recruits for a representative sample of service members (at times across both the active and reserve components), and already contains some items capturing barriers to care.

Option 1: Use the Item Banks to Track Trends in Service Members' Perceived Barriers to and Facilitators of Mental Health Care

This option would require DoD to administer a new longitudinal cross-sectional survey to a representative sample of service members or embed items from the banks into an existing survey, such as the Health Related Behaviors Survey. DoD could purposefully

stratify the sample to allow for meaningful comparison across service branch, installation, battalion, or other levels of interest. This option would allow DoD to answer the questions: What are the most prevalent barriers to care? How is the prevalence of barriers to or facilitators of care changing over time? In addition, this option would allow DoD to determine whether there are any specific groups (e.g., demographics, pay grades) reporting more barriers that should be targeted for specific intervention.

To create a more well-rounded assessment of barriers and facilitators, DoD could expand the survey sample beyond service members to assess perceptions of barriers to care for service members among social networks (e.g., family, friends) and among mental health providers that predominantly serve the military population. The current item bank is constructed to capture barriers to and facilitators of care from service members, so some adaptation of instructions and validation of any new items would be required. However, collecting standardized measures across these populations could allow for triangulation across different data sources and provide important insights to help address any limitations of underreporting through service member self-report.

Option 2: Assess How Specific DoD Interventions Affect Self-Reported Barriers to and Facilitators of Care

To answer the question, "How do specific DoD interventions affect self-reported barriers to and facilitators of care?" DoD would need to time the aforementioned survey to occur before and after the interventions of interest; in addition, questions on exposure to the interventions would need to be added to the survey. For example, if DoD is interested in understanding whether videos showing strong and successful service members who received mental health treatment are reducing perceived barriers related to military norms (e.g., fear of being seen as weak, fear that sharing emotions will be viewed unfavorably) among junior enlisted service members, DoD would need to include a series of questions assessing exposure to the videos. This approach is only able to assess the aggregate effects of all interventions on barriers and facilitators; it cannot isolate the effect from a single intervention. It may be useful for DoD to consider surveying a control group (a group of service members not exposed to the specific intervention of interest) to better isolate the effects on barriers to and facilitators of care that can be attributed to the specific intervention.

Option 3: Assess Which Perceived Barriers and Facilitators Predict Help-Seeking Behaviors

To answer the question, "Which barriers and facilitators predict help-seeking among service members?" DoD would need to administer a survey to a representative sample of service members (similar to option 1). However, to understand whether certain barriers or facilitators prospectively affect treatment seeking a longitudinal study would be required, with longitudinal tracking focused primarily on those service members who screen positive for a mental health problem (e.g., PTSD, depression, anxiety). This

option would require the use of a unique identifier to either link service members surveys over time or link survey data with treatment utilization data, which would mean that data collection could be confidential but not anonymous. This lack of anonymity could be of concern to service members and would require careful consideration of and communication about who would administer the item banks (an entity internal or external to DoD) and how the information would be used.

If DoD is interested in understanding which barriers and facilitators are predictive of service members completing treatment, a longitudinal survey (e.g., administered every 12 to 18 months) could be used with service members who enter treatment to monitor barriers and facilitators, as well as treatment engagement. New items would be needed to assess care quality and treatment experiences; however, some items from the bank could also be used for this survey. It is worth noting that two recent longitudinal studies (Acosta, Becker, et al., 2014; Adler et al., 2015) found two predictors: (1) service members who preferred family and friends over professional care were less likely to seek care; and (2) service members who believed that treatment seeking is helpful and takes courage were more likely to seek care. However, these studies did not use a representative sample of service members; therefore, it is unclear whether these predictors are universal (across DoD) or specific to the subgroups surveyed.

Option 4: Conduct Pilot Test(s) to Help Identify Best Ways to Deploy the Item Banks

DoD could conduct pilot test(s) to determine the most beneficial ways to use the item banks. Pilot tests of option 1 and option 2 could be funded to determine their feasibility (e.g., response bias, mode, lead agencies that should be involved). In particular, a pilot test of option 3 may yield important information about which barriers or facilitators to prioritize for data collection across the enterprise (i.e., would want to prioritize those that most strongly predict help-seeking and are modifiable through intervention). DoD could also conduct small-scale studies to empirically link specific interventions with reductions in barriers to care or improvements in facilitators of care and to guide specific quality-improvement activities at installations or military treatment facilities. Additionally, once a representative sample of participants is assessed using items from the banks, the mean scoring can be adjusted to reflect the broader DoD population.

Additional Considerations for Utilizing the Item Banks

Experts also provided more-specific suggestions to DoD about how to collect enterprisewide barriers and facilitators data. Based on their expertise running large-scale surveys or conducting large survey research or public health surveillance projects, experts described what worked well and what pitfalls to avoid related to data collection, system design, and sharing results. Suggestions made by at least two of the 20 experts are presented in the following sections.

Data Collection

Sampling Approaches

If enterprisewide data collection is required, DoD could consider using a multistage probability sample,[1] first stratified by area (e.g., state, region, census block, and household), and then by military-specific factors (e.g., service branch) within each area. If a multistage area probability sample is used, experts suggested collecting data continuously—for example, by dividing the sample into four portions and focusing each quarter on a portion of the sample. While this type of sampling approach requires monitoring the sample continuously, it allows data collection staff to reach the sample quickly and adjust data collection windows based on holidays, weather, operational calendars, key events (e.g., one expert oversampled in the U.S. Gulf Coast after the Deep Horizon oil spill), and other factors. The multistage sample also helps control for possible seasonal differences in behaviors and allows DoD to look at changes within a year (e.g., whether service members endorse a specific barrier or facilitator differently each quarter). Although experts focused on enterprisewide strategies, it is worth noting that sampling strategies must also be developed when using the item bank at the level of an installation or battalion. For smaller units, a census may be possible.

Modes of Administration

There was some disagreement among experts about the best mode of data collection. Some suggested that computer-assisted technology was better to collect such sensitive data as barriers to mental health care. Other experts said that an in-person administration (either face-to-face or via phone) would yield a better response rate and therefore better data. Research on household surveys has found that self-administration methods (e.g., paper or web-based survey) lessen concerns that individuals may misreport certain behaviors to comply with social norms (e.g., underreport substance abuse because they feel it is not socially acceptable) (Kreuter, Presser, and Tourangeau, 2008; Tourangeau and Smith, 1996). Interacting with an interviewer face-to-face has been shown to bias responses (Bowling, 2005). While the social norms bias is diminished in self-administered methods, self-administered programmed electronic surveys (e.g., computer-adaptive testing or web-based) have been shown to have less complete population coverage for sampling than self-administered paper surveys or face-to-face interviews—with paper surveys having the highest reported response rates (Nicholaas, Thomson, and Lynn, 2000). One option DoD could consider is administering the item bank via multiple modes—some in-person, some phone, and some web (using computer-assisted technology)—particularly if face-to-face administration is cost prohibitive. A multimode pilot test may also allow DoD to identify which mode yields the best response rates.

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[1] *Multistage sampling* refers to sampling plans where the sampling is carried out in stages using increasingly smaller sampling units at each stage.

Frequency of Administration

To track changes in barriers to care that require systems-level changes or interventions, experts viewed annual or even biannual data collection as frequent enough (or a staggered or multistage sample aggregated to produce annual estimates).

Confidentiality and Privacy Considerations

Experts agreed that service members needed a guarantee of confidentiality, although not necessarily anonymity, to answer questions honestly. They suggested that confidentiality could be established by selecting participants based on address, rather than name (so that a name never appears in the file). While not asking for names may increase feelings of confidentiality among participants, it is important to note that institutional review boards still consider addresses personally identifiable or sensitive information that requires safeguarding. Another suggestion from experts was to emphasize to service members that the data would only be used in aggregate (e.g., a book that shows how data will be analyzed with sample charts). Finally, experts suggested that messaging coming directly from the chain of command could help bolster the credibility of communication about confidentiality (i.e., leaders say that service members should take this important survey, but that leaders will not see their answers).

Nonresponse Considerations

Prior studies of service members have struggled to achieve a representative sample (Miller and Aharoni, 2015). For example, in the first round of data collection in the Millennium Cohort Study (Ryan et al., 2007), just 77,047 of the initially invited 256,400 service members participated, and there were significant differences between the responders and demographics of the U.S. military (older, more educated, married, and officers). Therefore, it may also help to have a supplemental nonresponse study to understand whether potential changes to mode, incentives, and other factors would help improve response. A nonresponse study would help DoD to understand whether demographic factors contribute to nonresponse bias and to appropriately target efforts to increase response rates.

Statistical expertise will also be needed to apply the appropriate weights to any data collected. Specifically, data will need sampling weights, which reflect the inverse of the probability of selection, and response rate weights, which reflect the bias in response.

System Design

Type of System Needed

Experts agreed that large surveillance systems are most useful for monitoring phenomena that are likely to change slowly over time. Research has found that changes

to social norms and population-level shifts in attitudes and beliefs are slow-moving (Roland, 2004). Consequently, shifts in perceptions of barriers to and facilitators of care that are linked to specific beliefs (e.g., mental health treatment does not work) or attitudes (e.g., mental health problems are a sign of weakness) may also be slow to shift. These types of barriers and facilitators may be better captured through ongoing surveillance. A similar approach has been deployed to track health-related risk factors, chronic health conditions, and preventive health practices across the U.S. population since 1984 (Nelson et al., 2000).

Process for Updating System

Experts recommended that DoD continue to do qualitative work to keep the item banks updated to ensure it captures the barriers to and facilitators of care that are important to service members and veterans (e.g., periodic focus groups with service members to determine whether key barriers or facilitators are missing from the item banks). If DoD does field a survey with items from the barriers and facilitators banks, experts also suggested including an area where service members can write in items that the survey may have missed. This allows service members to provide constructive feedback that may help the item banks to be more responsive to emerging barriers and facilitators.

If any changes or redesign efforts occur to the item banks, experts agreed that these should be rolled out in field tests prior to enterprisewide utilization. Field tests could use either a split sample randomly assigned to receive the different modes of survey implementation or different versions of the survey. If new items are being considered, item blocks could be added to the end of the survey (and then compared with existing items to see how they perform). For new items, confirmatory factor, IRT, and DIF analyses would need to be performed. If using web-based technology, there should be an operational pilot (field-testing) and a technical one (to identify any errors in survey programming before it is field-tested).

Sharing Results

Visible DoD Response

To motivate consistent and honest feedback, experts emphasized that DoD must show that it (or its installations) is responsive to issues flagged in the survey. The response needs to be communicated back to survey respondents, and some early programs should be put in place that individuals and installations can use to address barriers that might be identified through the survey.

Before collecting data on barriers and facilitators, it will be important for DoD to position itself appropriately to marshal a response, as needed. For example, if installations are fielding a survey using the item bank, DoD should be prepared to help

them tackle any prevalent barriers. This may require a repository of simple materials to address prevalent barriers, such as vignettes describing barriers and possible solutions or even a repository of solutions used by installations across the country. One option would be to pair the dissemination of the survey results with materials from ongoing DoD and U.S. Department of Veterans Affairs (VA) education and awareness campaigns offering mental health resources (e.g., Real Warriors Campaign, Military Crisis Line) that can help address identified barriers. Another option would be to stand up a learning collaborative of mental health providers that can share what has worked at their installations. Learning collaboratives, sometimes called *learning laboratories*, are multidisciplinary teams focused on using a continuous quality improvement process (e.g., Damschroder et al., 2009). Learning collaboratives have been shown to be an effective way to improve the implementation of mental health services (Nadeem et al., 2016).

Plan Ahead for Audiences and Modes

Because it is costly to collect survey data, experts emphasized that DoD should ensure that the data are disseminated to multiple stakeholders (DoD leadership, service branches, specific installations, VA, and academic researchers and their students) to maximize data use. This requires that DoD set aside resources to engage communications experts and researchers to develop annual reports, snapshots, dashboards, and more to make the data actionable and easy to understand. Experts recommended that these materials be developed in advance of data collection and disseminated within nine months of data collection; within a year of each data collection, DoD should release a public-use data set to encourage academics, students, and others to continue to analyze and help DoD learn from the data.

Limitations

The item banks focus on facilitators and barriers to treatment initiation and do not capture perceptions of the quality of care for service members in treatment. They focus on mental health problems generally and not on a specific mental health disorder (e.g., depression, PTSD). Finally, the item banks were calibrated based on a sample that allowed us to best determine whether items functioned differentially across specific subgroups (by gender, race/ethnicity, and more). As a result, our sample was slightly older and more educated than the military population. Finally, the item banks will need to be updated over time as new research identifies barriers to and facilitators of care not covered by the current barriers or facilitators banks.

Updating the Item Bank with New Items

As cutting-edge research emerges that identifies novel barriers to and facilitators of care, DoD may wish to update the item banks. To add items to the current item banks, DoD would need to repeat several of the methods used to develop the banks. Specifically, DoD would need to (1) estimate the new item parameters, (2) establish whether the new item bank is unidimensional (i.e., the bank represents a single construct) and does not include clusters of items that are highly correlated, (3) determine whether the new items function differentially (i.e., testing DIF) for different subgroups (e.g., race/ethnicity, gender), and (4) determine whether the new bank has good reliability and validity. To collect the data needed to estimate the new item parameters, DoD would need to administer any new items, as well as the existing bank items, to a large representative sample (e.g., includes service members from all service branches, a variety of pay grades, genders). The new items could then be evaluated using IRT and anchored to the same scale as the current banks to ensure that the new score would be comparable to the score using the barriers and facilitators banks described in this report. If new items are added, the short form and associated summed score to IRT scale score translation tables may also need to be updated using the same approach described in this report.

Conclusion

The item banks have great potential for monitoring barriers to and facilitators of mental health care in ways that have not been done before. The item-bank approach allows for more-flexible (i.e., can use different subsets of items to create a variety of short forms) and more-adaptive (i.e., can be updated over time as new research emerges) monitoring of barriers to and facilitators of care. If used in any of the ways suggested in this report, it could provide DoD with crucial insight into the obstacles that service members are facing. In particular, the item banks address several limitations of existing measures. The items broadly assess any type of mental health problem and any type of professional care, and they cover a variety of barriers related to the individual, social networks, treatment process, and social norms (Acosta, Becker, et al., 2014).

Implementing a monitoring system using the item banks will require coordinated planning efforts, leadership support, and significant resources to implement surveys that yield meaningful and actionable results. To be most effective, implementation should include not only getting the system up and running but also regularly sharing findings from any data collected (and possibly data sets) with key audiences (e.g., installation commanders, directors of military treatment facilities). Because of the flexibility of the item bank, we offer DoD a number of considerations for utilizing the item banks in ways that could track trends or aid in the evaluation of interventions to reduce barriers to seeking mental health care.

APPENDIX A

Methods Used to Identify Existing Measures and Develop a Conceptual Framework

As shown in Figure A.1, we conducted a literature review to identify relevant measures and scales, and then created a database of existing survey items for assessing barriers to mental health care and facilitators that encourage care-seeking. We removed duplicate items from the database and sorted items by conceptual similarity (i.e., according to a set of specific barriers to and facilitators of care identified from the literature review). Once the items were sorted, we interviewed RAND military fellows to identify any gaps in the types of barriers or facilitators being captured. Based on the barriers to and facilitators of care identified and a review of existing theoretical and conceptual models of care-seeking and barriers to and facilitators of care, we developed a framework to outline the key influences on a service member's decision to seek care and help us organize the database of items. Chapter Two has a detailed description of the framework. This appendix provides additional details on the step 1 methods used to conduct the literature review, sort items by conceptual similarity, and solicit feedback from military fellows.

Literature Review

To identify relevant measures, we conducted a comprehensive literature search on mental health stigma and other barriers to care in ten databases that focused on health (psychology and medicine); defense; and, broadly, the social sciences: PsycINFO (psychology), PubMed (including Medline), CINAHL (health care), EconLit (economics), Social Science Abstracts (social sciences), ProQuest Military Collection (defense), Sociological Abstracts (social sciences), Social Services Abstracts (social services), PILOTS (mental health), and Web of Science (general). The details of our search, conducted in July 2014, are specified in Table A.1.

Combining search results and removing duplicates between databases generated 3,124 sources. To ensure that all sources identified in the literature searches were relevant, we reviewed the article titles and abstracts to remove articles that were clearly irrelevant, leaving 118 tier 1 (relevant to measure review) and 28 tier 2 (relevant for

Figure A.1
Study Methods: Step 1

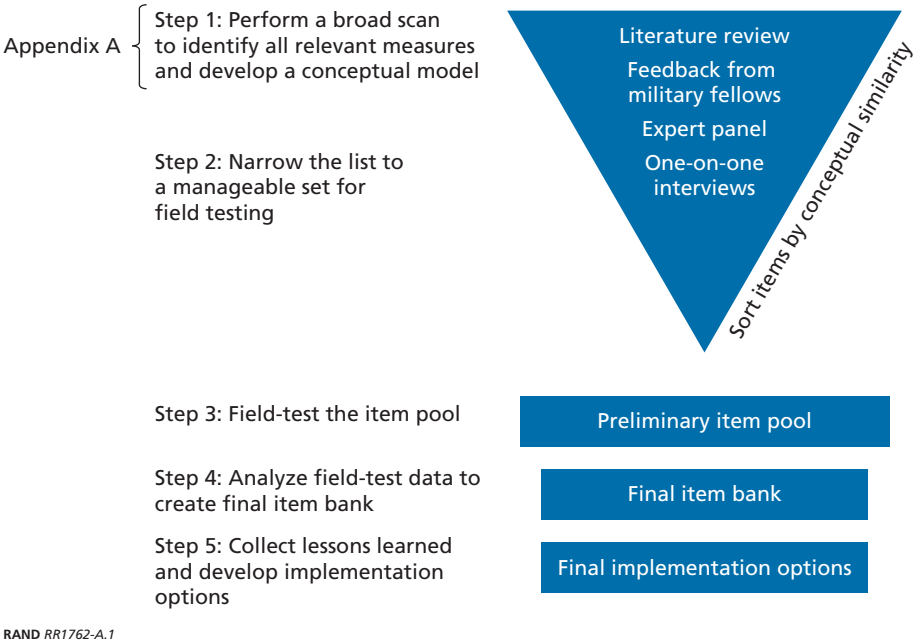
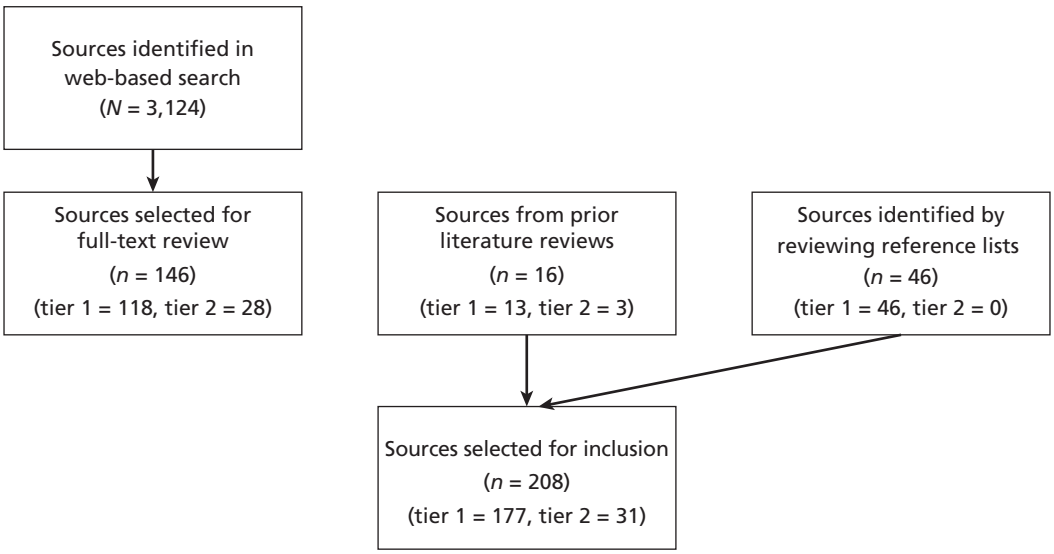


Table A.1
Literature Search Details

Question to Answer	Search Terms	Search Limits
What measures of stigma and other barriers to care are being used? Are most reliable and valid?	Concept 1: ("mental health" OR "mental illness" OR "behavioral health") AND Concept 2: (stigma OR discrimination OR "barriers to care" OR help-seeking OR "treatment seeking" OR treatment-seeking OR "care utilization" OR "treatment utilization" OR stereotypes) AND Concept 3: ("evaluat*" OR "assess*' OR "measure*")	• Since 2003 • English language • Peer-reviewed • Scholarly

background material) sources for full-text review. We supplemented our web-based search with sources identified in our previous literature review on mental health stigma (which extended our search to include sources from 2002), adding 13 tier 1 and three tier 2 articles to our review. Reviewing the references in these articles identified additional articles, ultimately resulting in a total of 177 tier 1 and 31 tier 2 sources for inclusion in our review. Figure A.2 shows a flowchart depicting the identification and exclusion of references. A list of all measures and citations related to barriers to care and identified from the tier 1 literature is provided at the end of this appendix in Table A.3.

Figure A.2
Flowchart for Literature Search



RAND *RR1762-A.2*

Sorting Items by Conceptual Similarity

We identified an initial list of 25 barriers to and facilitators of care discussed in the academic literature on mental health and treatment-seeking (see Table A.2) and sorted items according to the 25 barriers shown in Table A.2.

Of note, financial barriers (cost of care) were among the most frequently cited barriers to mental health treatment. About 60 to 70 percent of respondents in large community-based surveys said they were worried about cost (Sturm and Sherbourne, 2001; Sussman, Robins, and Earls, 1987). Studies have shown that people with better insurance coverage use more services (Manning et al., 1986; Taube, Kessler, and Burns, 1986). Rising copayments can also promote lower access (Simon et al., 1996). However, because active-duty military service members receive insurance coverage for mental health services through DoD, we eliminated this barrier from our work.

In addition, we identified a variety of theories that seek to explain this vast array of barriers to care. Each barrier likely interacts with and reinforces the others rather than acting in isolation. The relationship is complex, and a deeper and more nuanced understanding is needed for design, development, and implementation of preventive interventions.

Table A.2
Number of Items for Each of the Barriers to and Facilitators of Mental Health Care Identified Through Literature Review

Barriers	Number of Items
1. Assumed attribute	88
2. Concerns about career	116
3. Discrimination	107
4. Labeling	197
5. Blame	13
6. Military norms	42
7. Self-perceived weakness	64
8. Shame	48
9. Worthlessness	50
10. Family stress	29
11. Family/peer disclosure	41
12. Social distance	55
13. Violent	139
14. General help-seeking attitude	68
15. General mental health attitudes	23
16. Logistics	40
17. Medication side effects	98
18. Past experiences	13
19. Perceived effectiveness of treatment	32
20. Perceived need	51
21. Preferences for nonprofessional care	21
22. Literacy	47
23. Other misinformation or myths	52
24. Religious beliefs	135
25. Public disclosure	38
Total number of items = 1,607	

Feedback from Military Fellows

To supplement our knowledge of barriers to care from the literature review and to enrich our understanding of how barriers to mental health care operate in the military context, we conducted a series of interviews with 18 service members in RAND's Military Fellows Program. RAND's Military Fellows Program allows active-duty service members from all branches of the armed forces to participate in RAND research projects, seminars, and discussion groups for one year. The purpose of these interviews was to gather input on any barriers to care that might not have been represented in the published literature before we finalized our conceptual framework and pool of items for field-testing.

We purposefully tried to include a distribution by gender and service, given the potentially different views of mental health treatment informed by these factors. However, we had access to only two female respondents, so we were unable to analyze data for gender differences. We also attempted to obtain a service distribution, although most of the sample was in the Army or Air Force and we were unable to recruit any Marines. We did not have data on the exact age of our participants, but RAND military fellows tend to be midcareer service members between 30 and 50 years old. Thus, our findings may skew toward more individuals in leadership roles.

Participants were asked questions in the following areas:

- reasons why service members may be hesitant to seek or obtain care
- factors that influence mental health service decisionmaking (e.g., family, peers, logistics, and others)
- aspects of military culture that may inform decisionmaking
- service members' views on other service members' treatment-seeking
- perspectives on the study team's initial list of potential barriers to care domains (see Table A.2) and process of seeking or not seeking services, with attention to missing areas.

Interviews lasted 30 to 45 minutes and were conducted by phone by one of the study team members. The team member took notes on a laptop during the interview, and the notes were used to inform the themes summarized later in this appendix, the framework (described earlier), and the item bank development process.

Feedback on the Conceptual Framework

The initial framework articulated a set of factors that may influence a service member's identification of a mental health problem, decision to seek treatment, and pursuit of treatment. Military fellows offered feedback on these key influences and on barriers to care present in the military.

Identification of a Problem

Fellows were asked what factors may influence a service members' identification of a problem and decision to seek mental health services. The fellows generally discussed issues related to military culture, career risks or challenges, and perceptions that treatment would not be effective. While fellows said that there is less stigma associated with mental health services now because of broader military awareness and education, concerns remain that might not allow a service member to fully identify an issue or seek help.

In the area of military culture, some fellows noted that notions of stoicism and masculinity were central, as service members are valued for the ability to handle stress. In addition, military culture has historically been focused on not seeking external support, but rather relying on internal resolve to be resilient. Fellows indicated that this cultural value likely varies by service. For example, airmen may be more inclined to identify problems and seek treatment, while soldiers and Marines are praised for the ability to handle a range of stressors.

Some fellows described potential career challenges, in terms of both promotion and the ability to pursue particular roles or functions. For example, several fellows said that mental health problems could preclude the ability to maintain a security clearance. In addition, mental health problems would not be kept confidential but would inevitably be disclosed on career or professional records. One fellow remarked:

> One is career risks—you've probably heard that and I know there is some effort to reduce stigma. But the story on the recent Navy shooter brought talk of increased scrutiny of clearances for people with mental health issues. Certainly inability to get clearances would be a career risk. There is a sense that disclosure is inevitable—it is not something that you can keep quiet.

Other fellows noted that service members might not consider their issues as problems that should be addressed because they believe that seeking care would be useless or that treatment would be ineffective. One fellow explained that service members want immediate results and do not have the patience or interest in long-term therapy:

> Failure to see a tangible benefit in going [to treatment]. Just like we classify some of the invisible wounds of war, [I'm] not sure how visible some things are to soldiers even with increased awareness and increased access. It can be some of their expectations—[they] want to see a short-term benefit when [the treatment process] will take a little longer.

Decision and Process to Seek Treatment

Even after a service member has successfully identified that a problem may require additional intervention or support, there are important factors that can influence the actual decision to seek treatment and the ultimate process of obtaining services. Fel-

lows noted that family views and support, peer experience and perspectives, and logistical issues could render this process more or less difficult.

Family views, including those of spouses and parents, were significant variables that may shape or inform treatment-seeking behavior. Fellows noted that support from a loved one regarding the value and importance of treatment facilitates entry into care. Furthermore, support and interest from a family member, particularly when the problem is affecting marital and parenting relationships, can serve as the accelerant to obtaining mental health services.

In addition to family views, several fellows, particularly those in leadership roles, noted the value of peers. Respondents described how peers were highly influential in the decision to seek care. These peers could share personal experiences that may motivate service members to obtain help, or these peers could significantly affect or turn service members away from care. One fellow remarked:

> I found the peers to be very helpful . . . an enabler to seeking care. Peers had to recognize that there was a problem. They got good at that. Then the peers had to communicate to someone who could take action. I see that as tricky. Someone may post on Facebook; a friend may be concerned and then talk to leadership.

Finally, some fellows cited access issues, although to a lesser extent than the perception barriers described above. Fellows mainly focused on the availability of providers, particularly those that could provide appointments after business hours. A few fellows noted that service members might want to seek services from chaplains or other more-informal providers before a psychologist or licensed counselor, partly for reasons related to comfort but also because of the limited availability of these formal providers.

Feedback on the List of Barriers to Mental Health Care Identified

The fellows were asked what priority barriers needed to be addressed to facilitate problem identification and treatment-seeking. Fellows generally agreed that addressing concerns about career advancement would have the most significant effect on treatment-seeking. They suggested that stories of military leaders who had advanced despite a mental health problem would continue to be powerfully effective. One respondent shared, in reference to what barrier was key to address:

> Not public beliefs or attitudes or impact on social relationship—I think it's the concerns about career—we need to be able to hold people up and tell their stories of recovery and the great help I got from the mental health clinic when I was in need. Until we have these people come forward and say I did it and didn't lose my clearance . . .

Given these findings, we concluded interviews by sharing our initial list of barriers to care (Table A.2) to elicit fellows' views on whether the list covered the key themes

from the interview and to identify what may be missing. Overall, the fellows said the list was comprehensive, but some called for more constructs related to career readiness and confidentiality. In addition, they noted that while military culture was represented in the list, it was important to include those cultural notions in any scale that our team developed.

Table A.3
Existing Measures of Barriers to and Facilitators of Mental Health Care Reviewed to Inform Item Banks

Measure Name	Citation
Acceptance and Action Questionnaire (AAQ-16)	Bond and Bunce, 2003
Affective Reaction Scale	Penn et al., 1994
Attitude measure (no name)	Wahl et al., 2012
Attitudes toward depression and its treatments (no name)	Gabriel and Violato, 2010
Attitudes Toward Seeking Professional Psychological Help Scale (ATSPPH)	MacKenzie et al., 2004
Attitudes Toward Seeking Professional Psychological Help Scale Short Form (ATSPPH-SF)	Elhai, Schweinle, and Anderson, 2008
Attitudes Toward the Severe Mental Illness (ASMI)	Madianos, Economou, Peppou, et al., 2012
Attitudes Towards Attempted Suicide-Questionnaire (ATAS-Q)	Ouzouni and Nakakis, 2009
Attribution Questionnaire	Brown, 2008
Barriers interview (no name)	Sayer et al., 2009
Barriers scale (no name)	Schwenk, Davis, and Wimsatt, 2010
Barriers to Access to Care Evaluation (BACE)	Clement et al., 2012; Edlund et al., 2008
Barriers to Accessing Mental Health Services	Wang, 2006
Barriers to Care	Britt, Bennett, et al., 2011
Barriers to Care	Iversen, van Staden, et al., 2011
Barriers to care scale (no name)	Warner et al., 2008
Barriers to Help Seeking Scale	Mansfield, Addis, and Courtenay, 2005
Barriers to Mental Health Care	Litz and Maguen, 2006
Beliefs about psychotropic medication and psychotherapy (no name)	Bystritsky et al., 2005
Barriers to Treatment Participation Scale (BTPS)	Colonna-Pyden, Gjesfjeld, and Greeno, 2007

Table A.3—Continued

Measure Name	Citation
Beliefs About Seeking Treatment	Stecker, Fortney, and Sherbourne, 2011
Brief Sense of Community Index-Disability	Townley and Kloos, 2009
Care Access	Earnshaw and Quinn, 2012
Changing Minds Scale	Svensson et al., 2011
Children's Beliefs about Mental Illness	Adler and Wahl, 1998
Chronic Illness Anticipated Stigma Scale (CIASS)	Earnshaw et al., 2013
Coming Out with Mental Illness (COMIS)	Corrigan, Morris, et al., 2010
Communication Problems Scale	Savundranayagam, Hummert, and Montgomery, 2005
Community Attitudes Toward the Mentally Ill (CAMI)	Taylor and Dear, 1981
Community Attitudes towards the Mentally Ill (CAMI)	Morris et al., 2012
Consumer Experiences of Stigma Questionnaire (CESQ)–Stigma Subscale	Świtaj et al., 2013
Custodial Mental Illness Ideology Scale (CMI)	Gilbert and Levinson, 1956
Day's Mental Illness Stigma Scale	Day, Edgren, and Eshleman, 2007
Depression Attitude Questionnaire (DAQ)	Haddad, Walters, and Tylee, 2007
Depression Beliefs Inventory (DBI)	Edlund et al., 2008; Sayles et al., 2008; Gabriel and Violato, 2010
Depression Self-Stigma Scale (DSSS)	Kanter, Rusch, and Brondino, 2008
Depression Stigma Scale (DSS)	Coppens et al., 2013
Devaluation and discrimination questionnaire (no name)	Link, 1987
Devaluation of Consumers Families Scale	Struening et al., 2001
Devaluation of Consumers Scale	Struening et al., 2001
Devaluing Families with Mental illness Scale	Struening et al., 2001
Discrimination and Stigma Scale (DISC)	Brohan et al., 2013
Enacted Stigma	Kessler, Mickelson, and Williams, 1999
Everyday Discrimination Scale	Williams et al., 1997
Experience of Caregiving Inventory (ECI)	Szmukler et al., 1996

Table A.3—Continued

Measure Name	Citation
Experiences of Discrimination Scale (EOC)	Krieger et al., 2005
Family Burden Scale	Madianos, Economou, Dafni, et al., 2004
Fear and Behavioural Intentions (FABI)	Svensson et al., 2011
Feelings of Stigmatization Questionnaire (FSQ)	Wittkowski et al., 2007
Gorman's Barriers to Seeking Care	Gorman et al., 2011
Harvey Stigmatisation Scale (HSS)	Bagley and King, 2005
Health Information Orientation Scale (HIOS)	DuBenske et al., 2009
Help-Seeking Acceptability at School	Schmeelk-Cone et al., 2012
HIV Related Discrimination	Tsai et al., 2013
Impact of Illness Behavior Scale	Lively, Friedrich, and Rubenstein, 2004
Institutional Barriers	Ouimette et al., 2011
Internalized Stigma of Mental Illness Scale (ISMI)	Ritsher, Otilingam, and Grajales, 2003
Internalized AIDS-Related Stigma Scale	Tsai et al., 2013
Internalized HIV stigma (no name)	Sayles et al., 2008
Internalized Shame Scale (ISS)	Luoma, O'Hair, et al., 2010
Knowledge measure (no name)	Wahl et al., 2012
Knowledge Test of Mental Illness	Michaels and Corrigan, 2013
Link's Stigma Scale	Bagley and King, 2005
Male Gender Role Stress Scale	Eisler and Skidmore, 1987
Male Role Norms Inventory (MNRI)	Levant and Fischer, 1998
Male Role Norms Scale	Thompson and Pleck, 1986
Masculinity Ideologies Scale	Hirsch et al., 2009
Measures for Consumers Associated with Modified Labeling Theory	Link et al., 1989
Mental Health Attitude Survey for Police	Clayfield, Fletcher, and Grudzinskas, 2011
Mental Health Consumers' Experience of Stigma	Wahl, 1999
Mental Illness and Disorder Understanding Scale (MIDUS)	Madianos, Economou, Peppov, et al., 2012; Tanaka, 2003

Table A.3—Continued

Measure Name	Citation
Mental Illness: Clinicians' Attitudes (MICA) Scale	Kassam et al., 2010
Military and Stigma Scale (MSS)	Skopp et al., 2012
Motivation for Youth's Treatment Scale (MYTS)	Breda and Riemer, 2012
Multiculturally Sensitive Mental Health Scale (MSMHS)	Chao and Green, 2011
Opening Minds Scale for Health Care Providers (OMS-HC)	Kassam et al., 2010
Opinions on Mental Illness (OMI)	Rahav, Struening, and Andrews, 1984
Parental Attitudes Toward Psychological Services Inventory (PATPSI)	Turner, 2012
Perceived Discrimination Devaluation (PDD)	Interian et al., 2010
Perceived Stigma and Barriers to Care for Psychological Problems	Britt, Greene-Shortridge, et al., 2008
Perceived Stigma and Perceived Barriers to Care	Gould et al., 2010
Perceived Stigma of Addiction Sale (PSAS)	Luoma, O'Hair, et al., 2010
Perceived Stigma Questionnaire	Björkman, Svensson, and Lundberg, 2007
Perceptions of Stigmatization by Others for Seeking Help (PSOSH)	Vogel, Wade, and Ascheman, 2009
Personal Stigma Questionnaire	Cook and Wang, 2010
Prevalence of Attitudes Toward Health Seeking	Jagdeo et al., 2009
Psychiatric Disability Attribution Questionnaire	Corrigan, River, et al., 2000
Rejection Experiences	Björkman, Svensson, and Lundberg, 2007
Religious beliefs about mental illness scale (no name)	Wesselmann and Graziano, 2010
Reported and Intended Behavior Scale (RIBS)	Evans-Lacko et al., 2011
SAMSHA Mental Health and Alcohol Abuse Stigma Assessment	King-Kallimanis et al., 2012
Screen for Caregiver Burden	Hirschman et al., 2004
Self Stigma of Depression Scale	Barney et al., 2010
Self-Consciousness Scale	Rickwood and Braithwaite, 1994
Self-Esteem and Stigma Questionnaire (SESQ)	Hayward et al., 2002
Self-reported experiences of rejection (no name)	Link, 1987
Self-Stigma of Mental Illness Scale-Short Form	Corrigan, Michaels, et al., 2012

Table A.3—Continued

Measure Name	Citation
Survey on attitudes and understanding toward mental disorders (no name)	Siu et al., 2012
Social Distance (SD) scale	Interian et al., 2010
Social distance scale (no name)	Wahl et al., 2012
Socially Valued Role Classification Scale (SRCS)	Lloyd et al., 2008
Stigma and Social Impact of Disease	Fife and Wright, 2000
Stigma Concerns about Mental Health Care (SCMHC)	Interian et al., 2010
Stigma Consciousness Scale	Pinel, 1999
Stigma of Seeking Professional Psychological Health (SSPPH)	Komiya, Good, and Sherrod, 2000
Stigma of Suicide and Suicide Survivor Scale (STOSASS)	Scocco et al., 2012
Stigma of Suicide Attempt Scale (STOSA)	Scocco et al., 2012
Stigma of Suicide Scale (SOSS)	Batterham, Calear, and Christensen, 2013
Stigma Receptivity Scale (SRS)	Bambauer and Prigerson, 2006
Stigma Related Secrecy	Link, Struening, et al., 2002
Stigma Related Withdrawal	Link, Struening, et al., 2002
Stigma Scale (SS)	King et al., 2007
Stigma Scale for Chronic Illness (SSCI)	Rao et al., 2009
Stigma Scale for Receiving Psychological Help	Komiya, Good, and Sherrod, 2000
Stigma Scale for Receiving Psychological Help–Modified	Pyne et al., 2004
Stigma-Related Barriers	Ouimette et al., 2011
Stigma-Related Rejection Scale (SRS)	Luoma, Twohig, et al., 2007
Stigma, Negative Attitudes About Treatment, and Utilization of Mental Health Care Among Soldiers	Kim et al., 2011
Stigmatizing Attitudes-Believability (SAB)	Masuda and Latzman, 2011
Substance Abuse Self-Stigma Scale (SASSS)	Luoma, Nobles, et al., 2013
The Stigma and Barriers to Care Scale	Wright et al., 2009
Unit Support Scale	Pietrzak, Johnson, et al., 2009
Wahl's Stigma Scale	Bagley and King, 2005

APPENDIX B

Methods Used to Narrow Down the Measures to a Manageable List for Field-Testing

As shown in Figure B.1, we sorted items by conceptual similarity (as we did in step 1) to begin narrowing down the list of items identified in step 1 to a more manageable set for field-testing. We continued to winnow the items through one-on-one interviews and an expert panel.

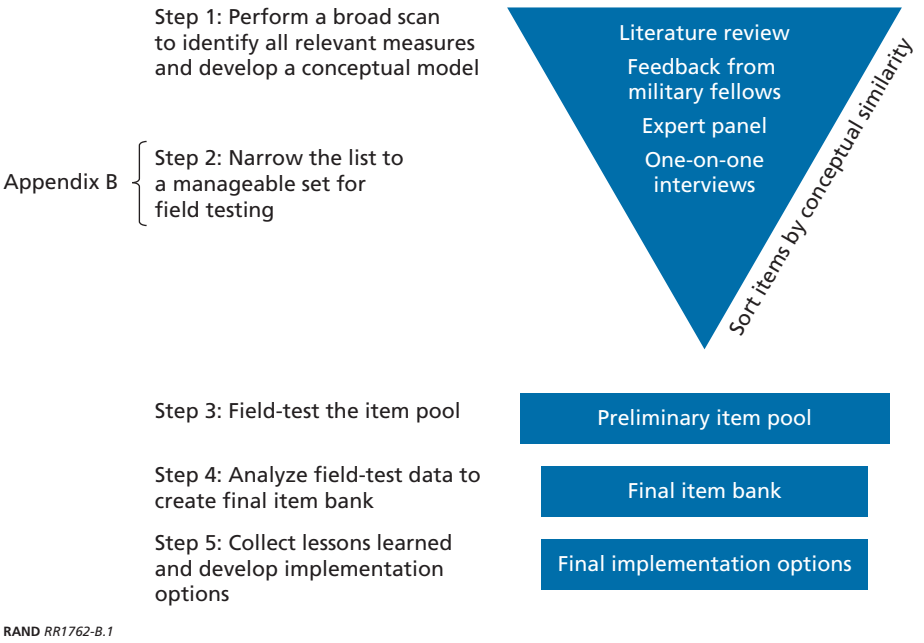
We narrowed the list of survey items from 1,607 to 235 by first sorting by conceptual similarity to remove redundant, unclear, or out-of-scope items for the bank (Figure B.2). Next, we elicited feedback on the remaining items from one-on-one interviews with current service members and an expert panel. Based on this feedback, we removed 120 items and added 16, yielding a preliminary pool of 131 items. During this process, we also refined our list of barriers and facilitators to 20 barriers (Figure B.2). We describe each of these steps in detail below.

Item Sorting by Conceptual Similarity

Once we refined the list of barriers and facilitators (Table A.2), we reviewed the items from the literature review and assigned them to a specific barrier. From the literature, we identified 123 relevant measures (see Appendix A), consisting of 2,588 candidate items (i.e., single-scale items assessing a barrier to care). These items were then divided in half, dissociated from the corresponding measure identifications, and put in random order. Two different team members independently sorted each half into specific barriers in Table A.2. Then, the entire study team convened to compare the sorting, discuss discrepancies, and reach a consensus for the barrier or facilitator assignment of each item. At the conclusion of this process, 981 items were identified as being either "unsortable" because they were redundant (e.g., verbatim copies of already-sorted items), unclearly worded, or not specifically focused on assessing a barrier or facilitator to care, leaving 1,607 items.

To refine the sorting and reduce the number of items, the study team used an iterative process of recategorization. Each team member was assigned a subset of barriers or facilitators to review and identify redundant and irrelevant items. After finding

Figure B.1
Study Methods: Step 2



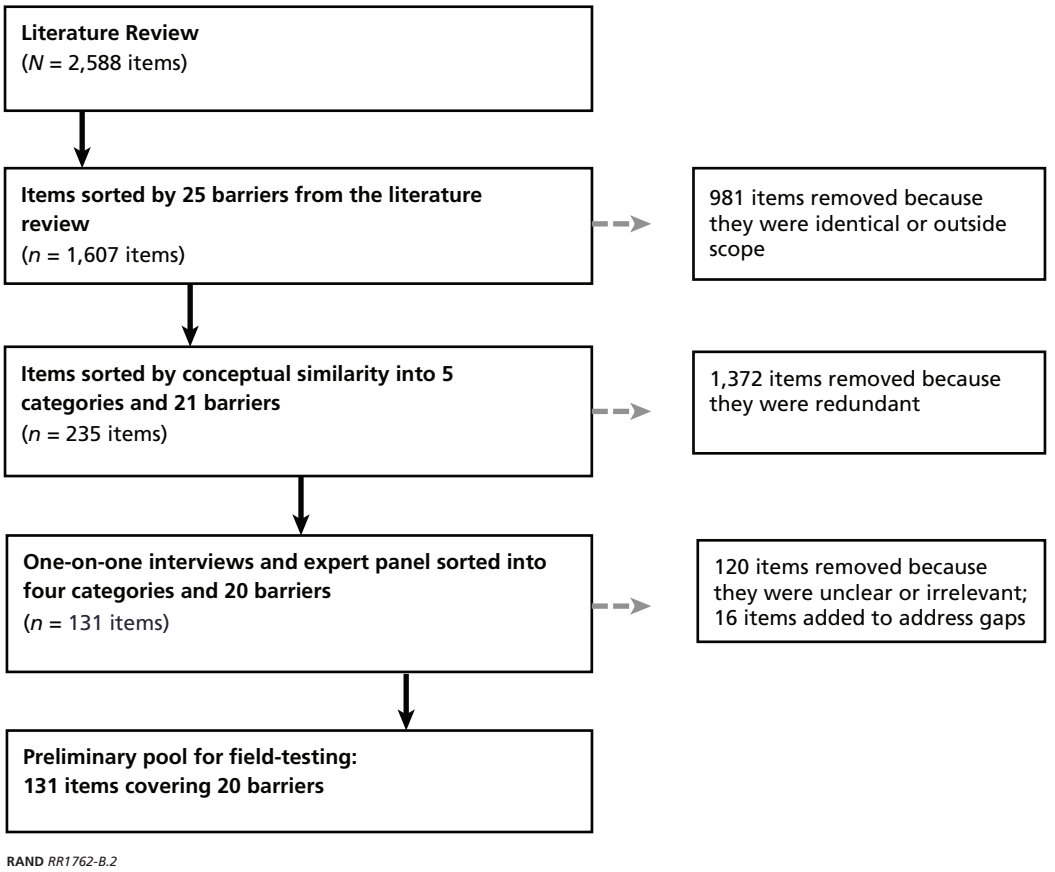
many items that could each fit into multiple barriers or facilitators, we elected to reclassify and adjust the barriers and facilitators to be more conceptually discrete. Using these new designations, we continued to narrow the item set.

Next, all items in the set were placed in random order, then two team members sorted the items into the existing barriers or facilitators, removing any items that were not relevant, not clearly worded, and did not capture discrete content. The same two team members discussed any discrepancies that arose before deciding to remove an item or deciding where to sort each item. In discussion with the team, a new set of 21 barriers and facilitators was identified (Table B.1) and grouped into four categories (barriers related to the individual, social networks, treatment, and military norms). Several barriers or facilitators were identical to previous categories, while others were combined or split into multiple barriers or facilitators. As a result of this process, the candidate items were reduced to 235—a more manageable number for soliciting feedback from interviews and the expert panel.

One-on-One Interviews

To elicit insight on the appropriateness and importance of items, we conducted one-on-one interviews with ten participants with military experience (see Table B.2 for characteristics of participants). Interviewees were a convenience sample recruited through the

Figure B.2
Schematic Representation of Preliminary Item Pool Development



RAND *RR1762-B.2*

RAND Military Fellows Program and two provider agencies that work with military families. Interviews were conducted by phone, and no compensation was provided. Interviewers obtained informed consent at the beginning of each call before collecting any data from participants.

In advance of the interviews, participants were asked to review a file that contained half of the 235 candidate items (i.e., either 117 or 118 items). During the phone interview, the interviewer asked participants about general thoughts or reactions to the items they reviewed. The interviewer then reviewed each item with participants, asking the participants to indicate any items or language that seemed odd, confusing, difficult to understand, or problematic in the military context. Participants were also asked to indicate whether any items were especially good or useful. After reviewing each item, participants were asked whether there were topics that they felt should be covered but were missing. They were also asked about how they interpreted the phrases frequently

Table B.1
Number of Items for Each of the Revised Barriers to and Facilitators of Mental Health Care Identified Through Item Sorting

Barriers	Number of Items
1. General approach to help-seeking	5
2. Moral/religious beliefs	11
3. Perceptions of the origins of mental health problems	8
4. Shame and internalized blame	17
5. Attitudes toward individuals with mental health problems	15
6. Attitudes toward mental health care	6
7. Burden to friends, family, and society	5
8. Concerns about being labeled	4
9. Concerns about career	16
10. Public disclosure of mental health problems	14
11. Intentions to seek treatment, if needed	7
12. Reactions of social support network (family, friends, peers)	17
13. Social isolation and distance	30
14. Concerns about confidentiality of the care process	7
15. Concerns about medication	3
16. Logistics of accessing care	11
17. Perceptions about recovery from mental health problems	8
18. Perceptions of the treatment process	13
19. Preferences for nonprofessional care	5
20. Public reactions to treatment-seeking	12
21. Military norms	21
Total number of items = 235	

used in question stems (i.e., "if you had mental health problems," "if you sought mental health treatment").

We made the following changes to the item pool based on the results of the cognitive interviews.

- We deleted or revised several items identified by participants as odd, confusing, difficult to understand, or inappropriate for the military context.

Table B.2
Characteristics of Participants in One-on-One Interviews

Characteristic	Percentage
Male	80
Age	
20–24	10
25–29	10
30–34	10
35–40	40
41–44	30
Ethnicity	
Hispanic/Latino	10
Race	
White/Caucasian	100
Pay grade	
O-1–O-3	20
O-4 or higher	80
Service branch	
Air Force	30
Army	40
Marine Corps	0
Navy	30

NOTE: For the single military spouse, participant pay grade and service branch are reported for the service member (i.e., participant's spouse).

- Several items used phrases "coming out of the closet" when referring to disclosing having a mental health condition or seeking treatment. Nearly all participants felt that this phrase would not work well in the military context. Items using this phrase were either revised or deleted.
- Many items contained the phrase "mental health problems." Participants interpreted this phrase differently. We did not change individual items in response to this feedback, but we provided a definition in the instructions for the field test.

Expert Panel

We convened an expert panel consisting of experts in mental health treatment-seeking and health care and mental health in the military to provide feedback on the conceptual framework and items being considered for field-testing. Experts were chosen based on their research expertise (i.e., published scientific research on mental health treatment-seeking) and practice-based expertise (i.e., experience running a large organization that provides mental health or support services to service members and families). The experts who served on the panel were the following:

Patty Baron, M.S., is the director of family programs at the Association of the United States Army (AUSA). She supports all AUSA family programs and activities by providing management and oversight to all directorate activities, including establishing and maintaining relationships with DoD and nongovernmental organizations, representing AUSA on DoD and Department of the Army councils and working groups, disseminating information to Army families on current programs and benefits, and working closely with other AUSA directorates by engaging in AUSA chapter and installation visits to keep abreast of issues and challenges facing today's Army families.

Thomas Britt, Ph.D., is a professor of social and organizational psychology at Clemson University. Britt's research focuses on military psychology, including investigating how barriers to care (such as stigma) influence mental health treatment-seeking among military personnel and what factors promote resilience among service members returning from deployments.

Deniz Fikretoglu, Ph.D., is a scientist at the Canadian Institute for Military and Veteran Health Research. Her areas of research include trauma and PTSD, psychological resilience, determinants of mental health service use (focusing on timeliness and adequacy of care, attitudinal barriers to care, and improving theoretical models of care-seeking), and efficacy research for workplace mental health interventions that promote mental health literacy.

Kristie Gore, Ph.D., is a senior behavioral social scientist at the RAND Corporation and the associate director for military health in the Forces and Resources Policy Center in the National Security Research Division. Her research focuses on the evaluation of treatment strategies, care-seeking behavior, and care models, and she was recently involved in a large-scale Army effort to treat PTSD and depression in service members seeking primary care.

Jackie Maffucci, Ph.D., research director at Iraq and Afghanistan Veterans of America (IAVA), leads the development of IAVA's short and long-term research initiatives and policy recommendations on veterans' issues. Prior to joining IAVA, she worked with the provost marshall general and other senior leaders at the Armed Forces Services Corporation to develop, implement, and monitor research programs and opportunities to address the needs of the military.

John Roberts served in the Marine Corps from 1982 to 1996 and is currently the warrior relations executive vice president at the Wounded Warrior Project, an organization that helps meet the needs of service members with physical and mental injuries and raises public awareness about the needs of these warriors.

Michael Schoenbaum, Ph.D., is senior adviser for mental health services, epidemiology, and economics in the Office of the Director at the National Institute of Mental Health (NIMH), National Institutes of Health. Schoenbaum is a health and labor economist, with additional expertise in economic demography. At NIMH, he directs a unit charged with conducting analyses of mental health burden, service use and costs, intervention opportunities, and other policy-related issues, in support of NIMH decisionmaking.

Nancy Skopp, Ph.D., is a research psychologist and program manager in the Research, Outcomes, Surveillance, and Evaluation Division of the National Center for Telehealth and Technology. Her research focuses on suicidal behavior among service members and veterans and technology-based psychological health interventions for military personnel.

Tracy Stecker, Ph.D., is an assistant professor at the Psychiatric Research Center at Dartmouth Medical School's Department of Community and Family Medicine. Stecker researches help-seeking behaviors in individuals with mental illness and has focused on the treatment of service members returning from the Iraq and Afghanistan wars with PTSD and substance abuse issues.

Jennifer J. Vasterling, Ph.D., professor of psychiatry, serves as the Chief of Psychology at VA Boston Healthcare System. She is also a clinical investigator within the Behavioral Sciences Division of the VA National Center for PTSD. Her research has centered on neurocognitive and emotional changes that accompany war-zone deployment and posttraumatic stress responses.

David Vogel, Ph.D., is a professor in the department of psychology at Iowa State University. His research has focused on the role of stereotypes on people's interactions, measuring the stereotypes of stigmatized groups and their effects on relationships, help-seeking, and counselor training.

LTC Chris Warner, M.D., is the Army Surgeon General's psychiatric consultant and Deputy Commander for Clinical Services, U.S. Army Medical Department Activity–Alaska. He has published several studies that focus on the psychological effects of deployments and the effectiveness of mental health screenings.

We utilized a modified version of the RAND Appropriateness Method (Fitch et al., 2001) to solicit expert panel feedback. First, experts were sent a background document containing results of a literature review on barriers to care, a framework of barriers to care, and a proposed set of domains and subdomains that encompass all barriers to care in the military. At the first meeting, the expert panel met via video teleconference to review the framework and discuss the list of candidate domains and subdomains included in the item pool. After the meeting, each expert received approx-

imately half of the item pool list and the entire list of barriers, and they rated these domains and subdomains and a subset of items for validity (How well does the item or domain describe an actual barrier to care?) and importance (How strongly does the item or domain influence help-seeking?). A 1–9 point Likert scale was used for each rating. We compiled these ratings and identified domains, subdomains, and items for which there was disagreement among the experts on validity, importance, or both. A full list of items with expert ratings is available at the end of this appendix in Table B.4.

We held a second videoconference meeting with the experts to discuss the domains, subdomains, and items on which there was disagreement, which are indicated in italics in Table B.4. Afterward, experts were asked again to rate the domains, subdomains, and items for which there was disagreement. These ratings were used to eliminate or revise domains, subdomains, and items.

In response to the expert panel ratings and feedback, we made the following changes:

- We removed the "moral/religious beliefs" barrier or facilitator because experts did not rate it as very valid (mean rating = 3.88) or important (mean rating = 4.25).
- We removed the "concerns about medication" barrier. Experts rated the subdomain as both valid (mean rating = 6.88) and important (mean rating = 7.13). However, the three individual items within the subdomain were rated low on validity (means ranging between 3.60 and 4.80) and importance (means ranging between 4.40 and 5.0). As a result, we eliminated the barrier and added three new items suggested by the experts to the "perceptions of the treatment process" barrier to capture potential medication concerns.
- Experts felt that many items were phrased negatively (e.g., items about not having social support for seeking treatment), so we incorporated several positive items (e.g., items about having social support for seeking treatment).
- Experts felt that responses to items could vary depending on which mental health condition was considered. As a result, we incorporated two disorder-specific items (one that referenced depression and one that referenced PTSD) into the field test so that these items could be compared with items that referred more generally to "mental health problems."
- We removed the "intentions to seek treatment, if needed" and "perceptions about recovery from mental health problems" barriers or facilitators. Items from these two were subsumed under other barriers or facilitators.
- Experts indicated that it would be useful to assess service members "attitudes toward mental health care (as compared with more traditional health care)," so two new items and a new barrier were added.
- We expanded military norms to three specific barriers: norms related to stoicism, strength, and unit cohesion (i.e., sustained commitment to other members of the unit and the mission despite stress).

We determined a target number of items for the preliminary item pool based on the design for the survey field test. The fielded survey was developed based on a randomized block design. Our design sought to balance the amount of covariance coverage across item pairs and the total sample size contributing to the marginal item frequency counts. Given that our expected sample size is N = 1,200 and that we aimed to administer no more than 100 items to each respondent, we elected to use a four-block form design. For this design, the response items were divided into four mutually exclusive nonoverlapping blocks with each block containing approximately equal numbers of items. The blocks were arranged into four different overlapping test forms each containing a different set of only three blocks (i.e., form 1 has blocks 1–3; form 2 has blocks 2–4; form 3 has blocks 1, 2, and 4; and form 4 has blocks 1, 3, and 4). This type of "planned item missingness" allowed us to administer a total of 131 items, but no more than 99 items on any single form. With this design, we expected each item to receive responses from a subset of n = 900 service members and each item pair to receive responses from a further subset of n = 600.

To reduce the item pool to a number close to the target of 131 items, team members reviewed the expert ratings and one-on-one interview feedback on the full list of items to identify the top half of items for each barrier and recommending the deletion of about half the items for each barrier. Items that were redundant with other items were deleted. Through team discussions of the top and bottom half of items and redundant items, the 131-item pool was finalized. The number of deleted items and new items incorporated into the preliminary item pool after the one-on-one interviews and the expert panel process are summarized in Table B.3.

Table B.3
Summary of Item Deletions or Additions in Response to Feedback from the One-on-One Interviews and Expert Panel

	Number of Initial Items	Number of Items Removed	Number of Items Added	Final Number of Items
Barriers/facilitators related to the individual				
Attitudes toward mental health care (compared with more traditional health care)	0	0	2	2
General approach to help-seeking	5	3	0	2
Moral/religious beliefs	11	11	0	0
Perceptions of the origins of mental health problems	8	2	0	6
Shame and internalized blame	17	12	0	5

Table B.3—Continued

	Number of Initial Items	Number of Items Removed	Number of Items Added	Final Number of Items
Barriers/facilitators related to social networks				
Attitudes toward individuals with mental health problems	15	6	0	9
Attitudes toward mental health care	6	4	0	2
Perception of burden to friends, family, and society	5	3	0	2
Concerns about being labeled with a mental health problem	4	2	0	2
Concerns about career	16	1	2	17
Intentions to seek treatment, if needed	7	7[a]	0	0[a]
Public disclosure of mental health problems	14	10	0	4
Reactions of social support network	17	8	2	11
Social isolation and distance	30	11	2	21
Barriers/facilitators related to treatment				
Concerns about the confidentiality of the care process	7	0	0	7
Concerns about medication	3	3[a]	0	0[a]
Logistics of accessing care	11	2	0	9
Perceptions about recovery from mental health problems	8	8[a]	0	0[a]
Perceptions of the treatment process	13	7	6[a]	12
Preferences for nonprofessional care	5	1	0	4
Public reactions to treatment-seeking	12	6	0	6
Barriers/facilitators related to military norms				
Military norms (strength, stoicism, part of a unit)	21	13	2[b]	10
Total	235	120	16	131

[a] Items from the "intentions to seek treatment, if needed," "concerns about medication," and "perceptions about recovery from mental health problems" barriers or facilitators were subsumed under other barriers or facilitators.

[b] Disorder-specific items were added to this barrier or facilitator.

Table B.4
Expert Panel Mean Ratings of Candidate Items' Validity and Importance

	Validity		Importance	
Item by Barrier	**Mean**	**Range**	**Mean**	**Range**
Barriers related to social networks				
Barrier 1: Attitudes toward individuals with mental health problems	7.67	4	7.67	4
If I had mental health problems, people would think I was violent.	7.50	5	7.00	5
If I had mental health problems, people would believe that I was just as trustworthy as the average citizen.	7.17	5	6.67	5
If I had mental health problems, people would feel unsafe around me.	7.67	6	6.50	5
If I had mental health problems, people would think I was dangerous.	7.50	6	6.50	6
If I were diagnosed with a mental health problem, I would feel stigmatized.	7.33	4	6.33	6
If I had mental health problems, people would not give me any responsibility.	7.00	5	7.50	4
If I had mental health problems, people would see me as inferior.	6.83	5	7.33	4
Only people who are weak and overly sensitive let mental illness affect them.	7.67	2	7.67	2
If I had mental health problems, people would think I was irresponsible.	6.33	7	6.50	5
If I had mental health problems, people around me would worry that I might harm them physically.	6.33	7	5.83	7
Many people with mental health problems don't try hard enough to get better.	6.17	4	5.67	5
People with mental health problems cannot control their emotions.	6.17	5	5.33	3
People with mental health problems should not be allowed to raise children.	4.83	7	4.33	7
If I had mental health problems, people would believe that I was just as intelligent as anyone else.	4.83	7	4.50	5
People with mental health problems should never be treated in the same hospital as people with physical illnesses.	3.17	4	3.67	4
Barrier 2: Attitudes toward mental health care	7.44	6	7.56	4
The military should do more to help people with mental health problems get better.	6.83	6	6.83	6

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
To the extent possible, mental health services should be provided from within the military.	6.00	5	6.50	5
There are sufficient existing services for people with mental health problems.	5.33	7	4.83	8
Increased spending on mental health services is a waste of tax dollars.	4.50	5	3.80	3
Locating mental health facilities in a residential area downgrades the neighborhood.	4.67	6	3.67	7
There is little that can be done for patients in a mental hospital, except to see that they are comfortable and well fed.	3.83	6	3.67	8
Barrier 3: Perception of burden to friends, family, and society	6.22	8	6.78	5
If I had a mental health problem, I would stay in the closet regarding my problem to avoid harming my family.	7.17	4	7.50	4
If I had mental health problems, I would be unable to contribute anything to society because of my problems.	6.67	7	6.17	7
If I had mental health problems, I would worry that I was a burden to others because of my problems.	6.67	5	6.67	5
If I were having mental health problems, I would feel that I was a burden on my family.	6.83	4	6.83	5
If I were having mental health problems, I would feel that I was a burden on my friends.	6.50	5	6.17	6
Barrier 4: Concerns about being labeled with a mental health problem	7.89	4	8.00	4
Concern that I might be seen as "crazy" would discourage me from seeking professional care for mental health problems.	8.17	2	8.17	2
If I were having mental health problems, I would stay in the closet to avoid being labeled as a person with mental illness.	7.67	4	8.50	2
People could tell if I had mental health problems by the way I looked or acted.	4.33	5	4.33	4
People with mental health problems look ill.	4.17	7	3.00	4
Barrier 5: Concerns about career	8.33	3	8.67	2
Evidence of mental health care in my medical records could harm my career.	8.50	2	9.00	0
Having been diagnosed with a mental health problem would be a blemish on my military record.	8.67	2	9.00	0
I would be given less responsibility if my chain of command knew I was seeking help for mental health problems.	8.67	2	9.00	0

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
If I had mental health problems, I would only seek help if I was certain that my command would not be able to find out the details.	8.67	2	8.83	1
If I had mental health problems, it would be helpful to get care after hours so that my unit would not know about it.	8.50	2	8.50	2
If I sought help for mental health problems, I am afraid that my chain of command would find out what I told the mental health provider.	8.33	2	8.50	2
If I were accessing mental health care, I would be concerned it might harm my chances for promotion.	8.67	2	7.33	8
If I had mental health problems, members of my unit would have less confidence in me.	8.33	2	8.33	2
If I were having mental health problems, I would stay in the closet about it to avoid negative impact on my career.	8.33	3	8.33	2
It would be risky to reveal that I had sought help for mental health problems on my security clearance application.	8.50	3	7.83	4
If I were having mental health problems, I might be discharged if my unit leadership found out about it.	7.50	5	7.67	5
If my chain of command discovered I was seeking help for mental health problems, I would lose their respect.	8.17	2	8.33	2
If I were receiving mental health treatment and my unit knew about it, they would think I was unreliable.	8.00	2	8.17	3
If I had mental health problems, I would be more likely to seek care if unit leadership would assure me that seeking care would not harm my career.	7.00	4	7.50	6
If I were having mental health problems, I would be able to work.	6.50	2	6.00	5
People successful in their work rarely have a mental health problem.	6.50	4	6.50	4
Barrier 6: Intentions to seek treatment, if needed	7.22	5	7.11	5
If I had mental health problems for a long time, I would seek professional help for them.	7.83	4	8.50	3
If I had mental health problems, I would be reluctant to seek help.	8.33	2	8.50	1
If I had mental health problems, getting mental health treatment would be a last resort.	7.83	4	8.17	2
If I had mental health problems, I would be interested in receiving treatment for them.	8.17	2	7.83	3

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
If I had mental health problems, I would ask to see a counselor or mental health professional.	7.67	4	8.17	3
If I had mental health problems, I would only seek care if the problems were extreme.	7.50	3	8.17	3
If I had mental health problems, I would not seek help because I wouldn't want to overreact to problems that aren't serious.	6.33	7	6.33	6
Barrier 7: Public disclosure of mental health problems	6.56	5	6.33	6
If I had a mental health problem, I would stay in the closet because I would fear negative reactions from others.	7.50	5	6.60	4
If I had mental health problem, I worry that people who knew would tell others.	7.00	5	7.00	5
If I had a mental health problem, there would be no reason for me to hide it.	7.00	3	7.33	4
If I had a mental health problem, I would put a lot of effort into hiding it.	7.33	5	6.83	5
If I had mental health problems, I would worry that people may judge me when they found out.	7.00	3	7.50	3
If I had a mental health problem, I would be very careful about who I told about it.	6.83	4	6.17	6
If I had mental health problems, I would stay in the closet regarding my problems to avoid harming my family.	6.33	4	6.17	4
If I had mental health problems, I would encourage other members of my family to keep them a secret.	6.00	4	5.67	5
If I had a mental health problem, I would come out of the closet regarding my problem to help others with the coming-out process.	6.00	6	5.17	6
If I had mental health problems, telling other people would be a mistake.	6.00	3	5.60	5
If I had a mental health problem, I would be open about it with most people.	5.50	7	6.60	5
If I had recovered from a mental health problem experienced earlier in life, I would not tell other people about it.	4.50	5	4.00	5
If I had mental health problems, I would stay in the closet regarding my problems to avoid stress.	5.17	5	5.17	5
If I had a mental health problem, I would make a special effort to keep it to myself when I meet people for the first time.	4.67	6	4.50	6

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
Barrier 8: Reactions of social support network (family, friends, peers)	7.11	6	6.89	7
If I had mental health problems, I would be uncomfortable seeking professional help because people in my social or business circles might find out about it.	7.33	8	7.83	4
If I was getting help from a mental health provider, my peers would think less of me.	8.33	3	8.00	2
Concern about what my family might think or say is a barrier to accessing mental health care.	7.67	4	8.17	3
Concern about what my friends might think or say is a barrier to accessing mental health care.	7.83	4	8.17	3
If I were having mental health problems, other service members would respect my opinions less.	7.50	4	8.00	4
If I had a mental health problem, I would never admit this to any of my friends because I would fear being treated differently.	7.50	4	7.83	4
If I needed help for a mental health problem, my friends and family would strongly encourage me to seek care and would help me overcome barriers.	8.00	2	8.17	2
If I were having mental health problems, other service members would respect my opinions less.	7.67	3	7.83	3
I would lose the respect of other service members if they found out I was receiving help for my mental health problems.	7.00	5	7.33	5
If I had a mental health problem, other service members would not be very tolerant of my problems.	7.17	4	7.17	5
If I had mental health problems, I could go to most people in my unit for help.	7.33	3	9.00	0
If friends learned that I received treatment for mental health problems, they would be supportive and understanding.	7.50	3	7.67	4
If I had a mental health problem, I would not want to receive treatment because family members might not approve.	6.83	5	7.00	5
If I had mental health problems, it is likely that my friends or family members would not think highly of me due to the problem.	6.67	7	7.33	4
If I had a mental health problem, my family members or friends would tell me that I was feeling sorry for myself.	5.83	6	6.00	6
If I were seeing my regular doctor for treatment of mental health symptoms, I would be embarrassed about what my friends or family might think.	6.83	4	7.00	4

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
If I had a mental health problem, my family members or friends would tell me that I was using it to get attention.	5.83	5	5.17	6
Barrier 9: Social isolation and distance	6.56	5	6.33	5
If I had mental health problems, I would be seen as weak.	8.00	4	8.00	4
If I had mental health problems, some people would avoid me.	7.17	6	7.17	6
People would not want to be my friend if I had mental health problems.	7.00	7	6.67	7
If I had mental health problems, people would see it as a weakness of character.	7.83	3	8.17	3
People would avoid talking to me if I had mental health problems.	6.67	7	7.00	5
People would stop calling me after learning I had mental health problems.	6.83	7	6.50	7
If I had mental health problems, people would treat me unfairly.	6.50	7	6.67	6
If I had mental health problems, people in my community would treat me just as they would treat anyone.	7.00	6	7.17	6
I would be taken less seriously if I had mental health problems.	7.17	5	7.33	5
If I had mental health problems, I would be ridiculed.	6.83	6	7.17	6
If I had mental health problems, nobody would be interested in getting close to me.	7.00	5	6.83	5
If I had mental health problems, people would feel awkward and tense when around me.	7.17	4	7.17	4
If I had mental health problems, some people would seem uncomfortable with me.	7.17	5	6.83	5
If I had mental health problems, people would generally be understanding of my problems.	6.83	4	6.67	5
If I had mental health problems, people would treat me like an outcast.	6.83	5	6.33	6
If I had a mental health problem, I would lose friends by telling them.	6.00	7	7.00	5
If I had mental health problems, I would be scared of how other people would react to me.	6.17	6	6.33	6
If I had mental health problems, I would be seen as cowardly.	6.33	5	7.00	5
If I had mental health problems, I would feel set apart from others who did not.	6.60	5	6.20	6

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
If I had mental health problems, I would avoid getting close to people in order to avoid rejection.	5.83	7	5.33	7
If I had mental health problems, I would feel left out of things.	5.50	7	5.20	7
If I had mental health problems, it would be difficult for me to make friends.	5.67	5	5.83	5
If I had mental health problems, I would not feel alone because many others also have mental health problems.	5.33	7	6.00	5
I would avoid social situations because of my mental health problems.	6.00	6	6.00	6
If I had mental health problems, it would not affect my ability to sustain close relationships.	5.50	5	4.60	4
I would feel unwelcome in my neighborhood if I had mental health problems.	4.67	6	5.00	7
If I had mental health problems, I would feel lonely more often than usual.	4.67	5	3.83	4
If I had mental health problems, people would treat me like a child.	4.17	7	3.50	6
If I had mental health problems, I would feel emotionally distant from other people.	3.33	6	3.83	7
If I had mental health problems, people would think that I was more likely to lie.	3.83	5	3.50	5
Barriers related to military norms				
Barrier 10: Military norms	8.50	2	8.25	4
I do not want to appear weaker than my peers.	8.40	2	8.40	2
I would not be respected very much if I frequently talked about my worries, fears, and problems.	7.20	4	6.80	4
I would see myself as weak if I had mental health problems and could not fix them myself.	7.60	3	7.40	3
When the going gets tough, I should get tough.	6.50	8	5.75	5
Mental health problems are a sign of personal weakness.	7.20	4	7.20	4
The best therapy for many people with mental health problems is to be part of a cohesive unit.	7.00	4	6.40	5
I do not like to talk about feelings.	6.60	2	5.40	4
I do not like to get emotional about things.	6.20	3	5.60	5

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
When I'm feeling a little pain I should try not to let it show very much.	5.40	8	6.00	6
Strong-willed people can handle problems without professional help.	6.60	4	6.40	5
If I had mental health problems, I should be able to "pull myself together."	5.80	3	6.40	4
I think that it is not particularly important for me to control my emotions.	4.80	4	5.00	4
If I had mental health problems, I could snap out of it if I wanted.	4.60	6	4.60	6
If I saw a counselor, I would be admitting that I can't handle the stress of military life.	6.40	5	6.00	5
It is all right for me to cry or show my emotions.	4.80	8	6.00	6
Becoming depressed is a way that people with poor stamina deal with difficulties.	3.60	5	5.80	4
If I had mental health problems, it would show my strength to deal with them without professional help.	4.20	3	4.60	4
It would be stressful if others said that I was too emotional.	4.80	8	4.40	5
There is something admirable in the attitude of people who are willing to cope with their conflicts and fears without resorting to professional help.	4.00	6	5.20	4
If I were living with mental health problems, it would make me a tough survivor.	3.00	4	5.00	6
If I had mental health problems, I would be seen as brave for dealing with them.	3.60	2	4.60	6
Barriers related to the individual				
Barrier 11: General approach to help-seeking	6.38	5	6.25	5
I don't always go to the doctor's office when I should.	6.80	6	7.00	6
I try to suppress thoughts and feelings that I don't like by not thinking about them.	6.60	4	5.40	6
If I have a problem or a worry, I try not to think about it, and keep busy with more pleasant things.	5.40	7	5.20	8
I like to gather as much information as I can before making a decision.	5.20	4	6.00	6
I am able to take action on a problem even if I am not sure what to do.	5.00	2	3.75	5

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
Barrier 12: Moral/religious beliefs	3.88	7	4.25	7
If I had mental health problems, receiving treatment from my regular doctor would conflict with my religious beliefs.	5.60	8	5.20	8
If I had a mental health problem, others would view me as morally weak.	5.40	8	6.20	4
Mental health problems can be treated by prayer.	5.20	2	4.00	6
A person's relationship with God or a higher power has nothing to do with them having a mental health problem.	4.20	3	4.40	3
A lack of moral strength or willpower is a cause of mental health problems.	4.20	6	3.80	6
It is wrong to think persons with mental health problems simply need to read more scripture.	3.80	6	3.80	7
Mental health problems can cause an immoral or sinful lifestyle.	3.20	3	3.40	3
People with mental health problems are not going to their places of worship enough.	3.00	4	3.00	4
People with mental health problems are not praying enough.	3.00	5	2.80	3
People with mental health problems are not relying on their faith like they should.	3.20	4	3.80	2
People with mental health problems are, as a group, less religious.	3.20	3	3.40	2
Barrier 13: Perceptions of the origins of mental health problems	5.00	8	5.50	8
Mental health problems are often due to a chemical imbalance.	6.00	6	5.60	6
Mental health problems are like any other illness.	6.00	2	5.80	4
Mental health problems are often due to something biological.	5.40	7	5.20	7
Mental health problems are just a normal part of life's ups and downs.	5.00	4	4.20	7
One of the main causes of mental health problems is a lack of self-discipline and willpower.	4.40	7	3.60	6
It is best to avoid people with mental health problems, in order to avoid having a mental health problem yourself.	2.80	3	2.60	3
Many people develop mental health problems to avoid the difficult problems of everyday life.	2.80	4	2.20	2
Mental health problems can be avoided by ignoring negative thoughts.	3.60	6	2.25	4

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
Barrier 14: Internalized barriers (shame and self-blame)	8.13	4	8.38	4
I would feel embarrassed if others knew I was seeking professional help for mental health problems.	6.80	3	6.60	3
If I had mental health problems and asked for help, I would be admitting that my coping skills were inadequate.	6.60	2	6.50	2
If I had mental health problems, I would be disappointed in myself for having them.	5.60	7	5.40	7
If I were having mental health problems, being concerned that it might bring shame or disapproval on my family would be a barrier to care.	5.00	7	5.60	8
If I were having mental health problems, I would think less of myself for needing help.	5.40	6	5.80	8
I would feel ashamed if I had mental health problems.	5.20	7	5.00	7
I would feel embarrassed if I had mental health problems.	5.20	7	5.00	7
If I were suffering from mental health problems, I would feel responsible for my problems.	6.20	3	6.20	4
If I had mental health problems, I would be blamed for being unable to cope.	4.20	5	4.20	5
If I had mental health problems, I would feel guilty for having those problems.	4.20	6	4.80	4
If I had mental health problems, I would feel worse about myself if I could not deal with them on my own.	5.20	7	4.80	6
If I had mental health problems, I would have only myself to blame.	4.40	5	4.20	5
If I had mental health problems, it would be viewed as a sign of personal failure.	4.80	7	4.80	8
If I had mental health problems and failed to recover, it means I wasn't trying hard enough.	4.20	5	4.00	5
If I had mental health problems, people's attitudes about these problems would make me feel worse about myself.	4.00	6	4.80	5
If I had mental health problems, people would tell me that is what I deserve for how I live my life.	3.40	7	4.40	5
If I had mental health problems, it would be due to feeling sorry for myself.	3.20	4	3.20	4
Barriers related to treatment				
Barrier 15: Concerns about the confidentiality of the care process	8.63	2	8.88	1

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
Concerns about the confidentiality of the information I share would be a barrier to me seeking help if I had mental health problems.	8.60	2	8.60	2
If I had mental health problems, I would not seek help for them because I would not want them on my military records.	8.60	2	8.60	2
If I sought help for mental health problems, I would worry that my visit would not remain confidential.	8.80	1	8.80	1
If I had mental health problems, I would be concerned that others would find out if I went for help.	8.40	2	7.60	4
If I had a mental health problem, I would be afraid that my peers would find out what I tell my mental health provider.	8.20	2	7.40	4
If I had mental health problems, I would be uncomfortable seeking help because people might find out about it.	8.20	2	7.40	4
If I sought help for a mental health problem, I am concerned someone I know might see me.	6.80	5	6.60	5
Barrier 16: Concerns about medication	6.88	4	7.13	4
If I had mental health problems, I would not take any medications because they are addictive.	4.80	4	5.00	4
If I had mental health problems, I would not take any medications because they may make me lose control.	3.80	5	4.80	7
If I had a mental health problem, I would not take prescription medicines because of my religious beliefs.	3.60	2	4.40	4
Barrier 17: Logistics of accessing care	7.00	5	7.50	5
If I had mental health problems, I might not be able to get time off to get care without negative consequences from my unit.	8.40	3	8.40	3
If I had mental health problems, I would not know where to go to get professional care.	6.80	7	7.60	7
If I had mental health problems, I might not seek treatment because it would be difficult to get time off from work.	8.20	3	7.40	4
If I had mental health problems, it would be relatively easy for me to find the time to see a professional for those problems.	7.50	3	6.75	4
If I had mental health problems, it would be easy to get an appointment with a professional for those problems.	6.80	4	7.40	4
If I had mental health problems, finding transportation to the treatment location would be difficult.	6.20	8	6.40	8
If I had mental health problems, getting to the treatment location would be difficult because it is too far away.	7.20	5	7.20	6

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
If I had mental health problems, I would not seek care because mental health services are not easily available.	6.60	5	7.40	5
Not having mental health professions from my own ethnic or cultural background would keep me from seeking professional care for mental health problems.	6.20	6	6.25	3
If I had mental health problems, I would be concerned that treatment would last too long.	6.60	5	6.40	7
If I had mental health problems, I would not seek treatment because it would take time away from other important activities.	4.80	7	5.60	5
Barrier 18: Perceptions about recovery from mental health problems	6.38	8	7.38	4
People with mental health problems can recover.	7.40	5	6.80	7
People with mental health problems will never be able to fully recover.	5.00	7	5.40	8
If I had mental health problems, they would go away by themselves eventually.	5.80	5	5.80	6
People who take medication for a mental health problem will have to take medication for the rest of their lives.	4.60	7	5.40	6
People with mental health problems can't take care of themselves.	4.80	7	4.40	6
People with mental health problems cannot live a good, rewarding life.	3.80	6	5.20	6
There is little that can be done to help people with mental health problems.	4.00	8	5.40	6
People who show signs of mental health problems should be hospitalized.	3.40	4	4.00	6
Barrier 19: Perceptions of the treatment process	7.00	8	7.50	4
If I had mental health problems, I would not seek help because I distrust or dislike mental health professionals (like psychologists or psychiatrists).	6.40	7	6.00	7
If I had mental health problems, I would not seek help, because most counselors and professionals do not have expertise in military-related problems.	6.60	8	6.80	4
If I had mental health problems, I would not seek help because treatment does not work.	6.25	8	6.00	8
If I had mental health problems, I would be comfortable talking about them with a counselor or professional.	6.40	8	6.00	7

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
If I had mental health problems, I would not seek help because I would not have enough control over what goes on in treatment.	6.20	4	6.00	3
If I sought help for mental health problems, I am afraid that my counselor might find out something about me that might require hospitalization or some other treatment I wouldn't want.	6.40	3	6.40	3
If I had mental health problems, I would receive good care from the military.	7.00	4	6.80	4
If I had mental health problems, not wanting to talk about my feelings would discourage me from getting professional care.	5.60	8	7.20	3
I would not seek help for mental health problems because I would have to give too much personal information to the counselor.	6.20	4	6.00	5
If I had mental health problems, I would find relief in counseling or professional care.	5.80	4	5.40	4
If I had mental health problems, I would not seek help because counselors would not understand my needs.	6.00	2	5.60	2
If I had mental health problems, I would be concerned that treatment would be too much work.	5.80	4	5.80	4
If I had mental health problems, I would be more inclined to seek help if the health care provider treating me was not associated with the military.	5.60	2	5.40	1
Barrier 20: Preferences for nonprofessional care	6.25	8	6.25	6
If I had mental health problems, I would seek help from family or friends instead of professionals.	6.40	6	6.20	6
If I had mental health problems, I would try religious or holistic therapies, rather than medication or counseling.	6.80	4	6.80	4
If I had mental health problems, I would prefer to manage them myself.	6.20	8	6.20	4
If I had mental health problems, a minister or pastor would help me more than a professional counselor would.	6.20	4	5.00	8
If I had mental health problems, it would show my strength to deal with them without professional help.	5.00	7	5.20	7
Barrier 21: Public reactions to treatment-seeking	8.29	2	8.43	1
If I sought mental health treatment, I would be seen as weak.	7.80	3	7.80	3

Table B.4—Continued

Item by Barrier	Validity		Importance	
	Mean	Range	Mean	Range
If I sought help for mental health problems, I would be worried that others will view me unfavorably.	7.80	2	6.80	3
If I had a mental health problem, I would not want to receive treatment because of being afraid of what others might think.	6.40	3	7.00	3
If I had mental health problems, concern that I might be seen as weak would discourage me from getting professional care.	6.80	3	6.60	3
If I were ever treated for mental health problems, it would be best to keep it a secret.	5.60	8	5.80	8
My reputation in my community would be harmed if I saw a mental health provider and people knew.	5.80	4	6.40	6
If I had mental health problems, I would not seek help because people might not take me seriously.	5.60	7	5.80	4
If I had mental health problems, treatment would add another stressor to my life.	5.00	6	5.00	6
If I were a mental health service user, people would think less of me.	6.40	3	6.20	3
People would judge me poorly if they knew I had sought help for mental health problems.	6.00	4	5.60	3
If I sought help for mental health problems, I would feel like I was losing control of my life.	5.20	6	4.80	7
I would be shunned or avoided by others if it was revealed that I was a mental health service user.	5.60	4	6.50	3

NOTE: Items or subdomains in italics are those for which expert panelists indicated significant disagreement prior to the second meeting. These items and subdomains were discussed in detail at the second meeting.

APPENDIX C

Methods Used to Field-Test the Preliminary Item Pool

The final set of 131 items in the preliminary item pool were then field-tested with service members in the Air Force, Army, Marine Corps, and Navy at military installations around the United States. The step 3 methods (Figure C.1) used to field-test are described in this appendix, and the field-test results are detailed in Appendix D.

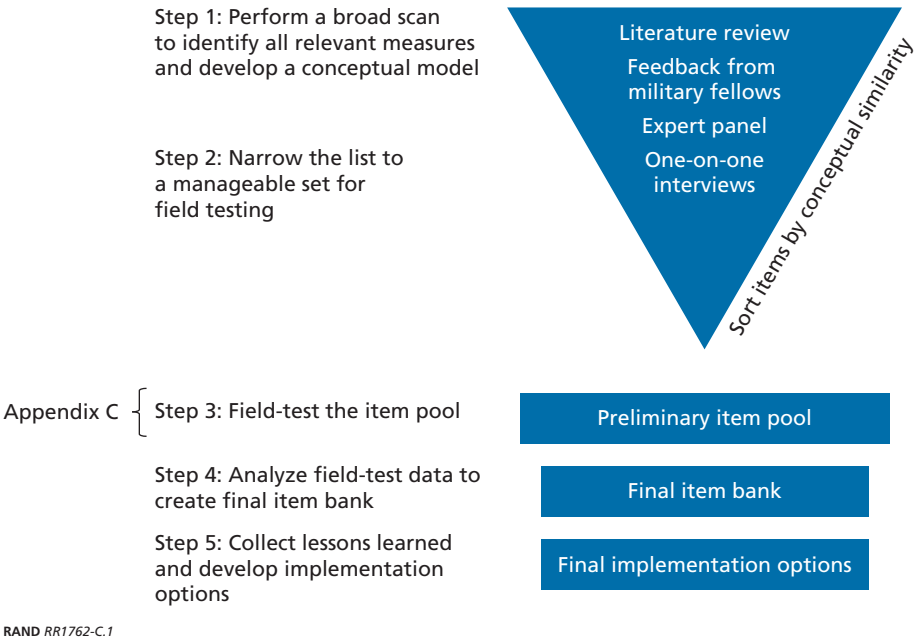
Completing a large-scale field test of the preliminary item pool required an intensive recruitment process to reach active-duty uniformed service members. Primary outreach occurred via email including an introduction letter explaining why the service member was being contacted and a brief description of the study. This background information acknowledged the data collection would be a one-time, anonymous 15- to 20-minute survey of service members. Installations that delivered occupational training courses to service members were targeted because they offered a convenient way to conduct targeted recruitment of service members from across the country in a single location. Service members were selected from a sample of leadership courses at installations at a time agreed upon by the occupational training course instructor.

Our preference was to field-test at sites that provided the best relative location (lowering survey cost to administer), availability (based on recommendations and responses from base leadership), and occupational training class size (the larger the survey pool at the location, the better). Sites included any U.S. military base in the continental United States primarily staffed by active-duty uniformed members of the armed services (as opposed to primarily National Guard or reserve stations). We requested, from all sites, access to training courses that would allow us to collect data from approximately 500 personnel from pay grades E-1 to E-9 and O-1 to O-6. Survey recruitment took place upon receipt of the DoD report control symbol (RCS) (DD-USA[OT]2591).

Once a survey visit was arranged and our staff was on site at the military installation with the group of service members gathered for the training course, the verbal consent form was read and displayed to inform service members that the survey was anonymous and voluntary and that they could leave at any time. Surveys were distributed and collected whether or not the surveys were fully completed.

The remainder of this appendix summarizes the data collection procedures and locations surveyed for the Air Force, Army, Marine Corps, and Navy, as well as respondent pay grades (which was a primary driver of how we selected training courses from

Figure C.1
Study Methods: Step 3



where to recruit). A full list of respondent demographics is available in Table 1.1 in Chapter One.

Air Force Data Collection

The Air Force survey approval process happened in coordination with the institutional review board for the U.S. Air Force University Office of Academic Affairs. As part of the survey approval process, an application packet was submitted that included proof of human-subject protection training and federalwide assurance letter. Initial contacts for the Air Force schools of interest were found online. We requested access to training courses at Maxwell Air Force Base (Montgomery, Alabama) with the intention of surveying airmen from pay grades E-4 to E-9 and O-1 to O-6. We were able to reach service members from pay grades E-7 to E-9 and O-1 to O-6 at Maxwell Air Force Base. To recruit the E-4–E-6 demographic, we worked through the Barnes Center at Air Force University and the noncommissioned officer (NCO) academies at Tyndall (Panama City, Florida) and Lackland (San Antonio, Texas) Air Force Bases. Table C.1 shows the installations where we collected data, and Table C.2 shows the count of surveys collected by pay grade. Specific counts by course are not provided because the surveys were anonymous, which means we did not record which surveys came from which course.

Table C.1
Air Force Installations and Courses Where Data Were Collected

Date	Installation	Course
10/26/15	Maxwell Air Force Base	Air War College
10/27/15	Maxwell Air Force Base	Air Command and Staff College
11/25/15	Maxwell Air Force Base	Squadron Officer School
10/26/15	Maxwell Air Force Base	First Sergeant Academy
11/5/15	Maxwell Air Force Base	Senior NCO Academy
11/9/15	Tyndall Air Force Base	Airey NCO Academy
12/9/15	Lackland Air Force Base	NCO Academy

Table C.2
Number of Air Force Surveys Collected by Pay Grade (*N* = 1,129)

	E-1–E-3	E-4–E-6	E-7–E-9 or W-1–W-5	O-1–O-3	O-4–O-6
Count	7	317	364	266	175
Percentage	1	28	32	24	15

Army Data Collection

Data collection at Army courses was approved as a result of our DoD RCS approval, which overrode the need for an Army approval. The initial Army contacts were found online through Army education portals. We asked to collect data at Fort Belvoir (Fairfax County, Virginia), Fort Eustis (Newport News, Virginia), Fort Benning (Columbus, Georgia), Fort Leonard Wood (St. Robert, Missouri), Fort Bragg (Fayetteville, North Carolina), Carlisle Barracks (Carlisle, Pennsylvania), the Joint Expeditionary Base at Little Creek (Virginia Beach, Virginia), and the Judge Advocate General's Legal Center and School (Charlottesville, Virginia). Table C.3 shows the installations where we collected data, and Table C.4 shows the count of surveys collected by pay grade. Specific counts by course are not provided because the surveys were anonymous, which means we did not record which surveys came from which course.

Marine Corps Data Collection

To receive approval to reach out to Marine Corps survey sites, we had to first apply and receive approval through the Marine Corps Institutional Review Board (IRB) for the Marine Corps University Training and Education Command. Once our IRB

Table C.3
Army Installations and Courses Where Data Were Collected

Date	Installation	Course
5/15/14	Fort Belvoir	Army Force Management School Army Operations Logistics Center
5/15/14	Fort Belvoir	Army Force Management School National Guard Bureau Course
5/15/14	Fort Belvoir	Army Force Management School How The Army Runs Course
6/9/14, 7/10/14	Fort Eustis	Aviation Center of Excellence
6/11/14	Fort Belvoir	Army Force Management School Sergeant Major Course
6/11/14	Fort Belvoir	Army Force Management School Functional Area 50 Course (Intermediate Level)
6/13/14	Fort Belvoir	Army Force Management School General Officers and Senior Executive Services Course
6/17/14	The Judge Advocate General's Legal Center and School	Officers Course
6/24/17	The Judge Advocate General's Legal Center and School	Warrant Officers and NCOs Course
7/14/14	Joint Expeditionary Base at Little Creek	U.S. Army School of Music Advanced Individual Training
8/25/14	Fort Benning	Maneuver Center of Excellence (Captains)
8/26/14	Fort Benning	Maneuver Center of Excellence (NCOs)
8/27/14	Fort Leonard Wood	Maneuver Support Center of Excellence
9/3/14	Fort Bragg	Special Warfare Center and School
9/22/14	Carlisle Barracks	U.S. Army War College

Table C.4
Number of Army Surveys Collected, by Pay Grade (*N* = 1,127)

	E-1–E-3	E-4–E-6	E-7–E-9 or W-1–W-5	O-1–O-3	O-4–O-6
Count	246	338	202	177	164
Percentage	22	30	18	16	14

approval letter was received, we sent initial email requests to contacts identified online to determine upcoming Marine Corps course dates and locations. We asked to collect data from Marines at the Marine Corps Base Quantico (Quantico, Virginia) and Camp Lejeune (Jacksonville, North Carolina). Because of availability and alignment of course dates, we also collected data from Camp Pendleton (San Diego County, California). Table C.5 shows the installations where we collected data, and Table C.6 shows the count of surveys collected by pay grade. Specific counts by course are not provided because the surveys were anonymous, which means we did not record which surveys came from which course.

Navy Data Collection

Data collection at Naval courses was approved as a result of our DoD RCS approval, which overrode the need for a Navy approval. The initial Navy contacts were found

Table C.5
Marine Corps Installations and Courses Where Data Were Collected

Date	Installation	Course
9/17/15	Camp Pendleton	Pendleton Sergeants Course
9/17/15	Camp Lejeune	Senior NCO Academy Career Course
9/18/15	Camp Lejeune	Senior NCO Academy Sergeants Course
9/18/15	Camp Lejeune	Senior NCO Academy Advanced Course
9/22/15	Marine Corps Base Quantico	Expeditionary Warfare School
10/20/15	Marine Corps Base Quantico	Quantico Sergeants Course
10/20/15	Marine Corps Base Quantico	Quantico Career Course
10/20/15	Marine Corps Base Quantico	Command and Staff College
10/21/15	Marine Corps Base Quantico	School of Advanced Warfighting (2 different courses)
12/2/15	Camp Lejeune	Senior NCO Academy Advanced Course
12/2/15	Marine Corps Base Quantico	Quantico Advanced Course

Table C.6
Number of Marine Corps Surveys Collected, by Pay Grade (*N* = 863)

	E-1–E-3	E-4–E-6	E-7–E-9 or W-1–W-5	O-1–O-3	O-4–O-6
Count	0	342	203	151	167
Percentage	0	40	24	17	19

online through Navy education portals. We asked to collect data at the U.S. Naval War College (Newport, Rhode Island), the Naval Station Norfolk (Norfolk, Virginia), the Naval Air Station Oceana (Dam Neck, Virginia), and the Center for Information Dominance (San Diego, California). Because of the smaller class sizes in Navy leadership courses, several data collection visits had to occur, especially for the E-4–E-9 demographic. Table C.7 shows the installations where we collected data, and Table C.8 shows the count of surveys collected by pay grade. Specific counts by course are not provided because the surveys were anonymous, which means we did not record which surveys came from which course. We collected fewer surveys from Navy personnel because the Navy's job discipline–specific training courses were more limited in class size than the other service branches.

Table C.7
Navy Installations and Courses Where Data Were Collected

Date	Installation	Course
8/5/15	U.S. Naval War College	College of Naval Warfare
8/5/15	U.S. Naval War College	Naval Command and Staff College
8/5/15, 12/9/15, 2/3/16	U.S. Naval War College	Senior Enlisted Academy
10/15/15	Center for Information Dominance	Unit San Diego
10/22/15 11/5/15	Naval Station Norfolk Naval Station Norfolk	Center for Surface Combat Systems (Detachment East) Surface Warfare Officers School Learning Site in Norfolk
11/5/16	Naval Air Station Oceana	Center for Surface Combat Systems (Dam Neck)

Table C.8
Number of Navy Surveys Collected, by Pay Grade (*N* = 557)

	E-1–E-3	E-4–E-6	E-7–E-9 or W-1–W-5	O-1–O-3	O-4–O-6
Count	48	186	231	21	71
Percentage	9	33	41	4	13

APPENDIX D

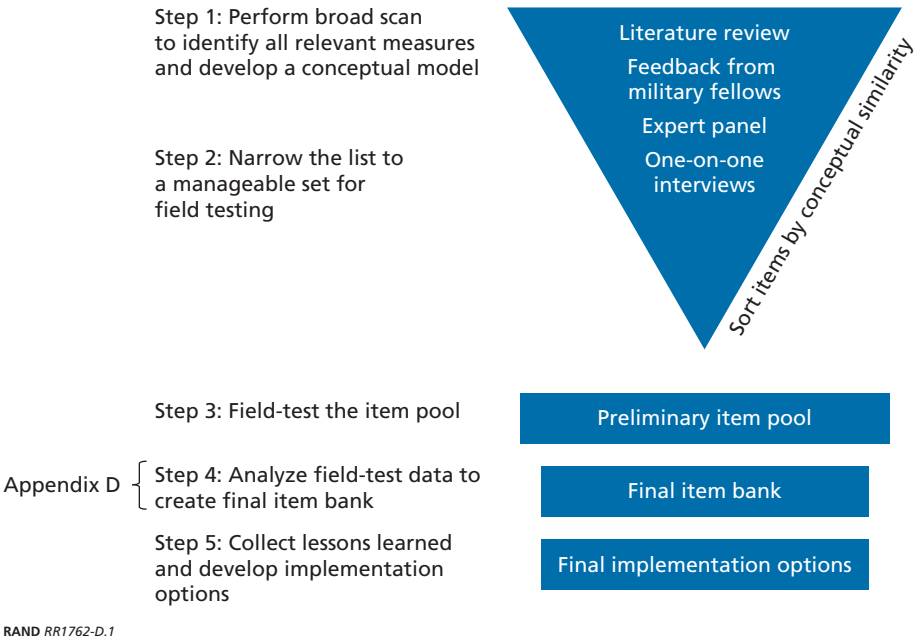
Methods Used to Analyze Field-Test Data to Create the Final Item Bank

The primary aim of this project was to build psychometrically sound item banks for assessing barriers to and facilitators of seeking mental health care in the military and to create a short assessment form that minimizes survey completion time and the burden on respondents without sacrificing scoring precision. The following analyses were used to create and evaluate appropriate items for the banks and to develop the short form for quick and efficient scoring.

Our field test had 3,676 service members complete the survey, which included the 131 items from the preliminary item pool; items assessing demographic characteristics, pay grade, deployment history, experience with mental health care; and one or more of three existing scales (i.e., Britt, Greene-Shortridge, et al., 2008; Hoge, Castro, et al., 2004; Levant, Hall, and Rankin, 2013). To analyze these data, we conducted descriptive analyses and used exploratory and confirmatory factor analysis, as well as IRT and evaluation of DIF. The purpose of the factor analyses was to determine the number of dimensions in the item pool. One characteristic of an item bank is that it reflects only a single dimension. Thus, the goal was to create item banks to assess each dimension in the item pool. Within each bank, items were evaluated based on their psychometric functioning and performance relative to the other items in the bank, and a short form of items was developed. To facilitate short-form scoring, a summed score to IRT scale score transformation table for the short form was generated.

The step 4 methods (Figure D.1) used to analyze the field-test data and create the final item banks are described in this appendix. This appendix first summarizes the approaches used to analyze the field-test data and then the findings of these analyses, including the specific items that comprise the final two item banks (a 54-item bank assessing barriers to mental health care and a six-item bank on facilitators of mental health care) and the 15-item short form compiled from items in the barriers bank.

Figure D.1
Study Methods: Step 4



Approach to Analyze Field-Test Data

Descriptive Analysis

Before evaluating psychometric models for the item pool, we computed basic descriptive statistics, including examining the proportions in each response category to identify the presence of highly skewed univariate distributions and the item-total correlations to ensure that all items were coded in the same direction, such that higher scores indicated more barriers to seeking care. If the item-total correlation was negative or close to 0, we reviewed the item wording and responses prior to reverse-coding the item. Reverse-coding was carried out where needed (e.g., BTC49: People that I am close to would support me in seeking mental health treatment). Once all items were correctly coded, the item-total correlations provided preliminary information about the extent to which the items related to one another. There were four disorder-specific items in the initial 131-item pool. These items, which used either "PTSD" or "depression" in place of "mental health problem" in the question stem, were included to explore the effects of referencing a specific common disorder rather than referring to general mental health problems. These disorder-specific items were set aside at this stage and not used to examine dimensionality of the item pool. These disorder-specific items were added back in during our tests of preliminary validity to determine their effects on bank scores (described below). All descriptive analyses were conducted in the software SAS.

Dimensionality Assessment and Initial Item Selection

With the item responses screened (and reverse-coded, if appropriate), we then moved on to exploring the underlying dimensionality with the goal of identifying sets of items that are essentially unidimensional in structure. To do this, we first randomly split the sample into two subsets, one for exploratory analyses (n = 2,200) and one for cross-validation (n = 1,476). Our analytic approach included estimation using exploratory (EFA) and confirmatory (CFA) factor analytic models, as well as IRT-based item parameter estimation and DIF evaluation. EFA and CFA were conducted with Mplus software (Muthén and Muthén, 1998–2010) for categorical response items. IRT calibration, DIF, and scoring were conducted with the software IRTPRO (Cai, du Toit, and Thissen, 2011).

Exploratory and Confirmatory Item Factor Analysis

The field-tested items were initially designed to represent different domains of barriers to care. EFA was conducted to determine whether a single scale could represent these items or whether it was appropriate to construct multiple scales. Therefore, the EFA step was exploratory in nature with the goal to (1) examine the number of dimensions and (2) identify problematic items for deletion such as ones that loaded poorly on all dimensions and/or loaded consistently on more than one dimension.

Using data from the exploratory subsample, we conducting EFA, and then used multiple criteria to determine the best number of factors to retain. For example, we examined the eigenvalues and scree plot, looked at the pattern of loadings, and the interpretation of the factors. Once the number of factors to retain was decided, we examined the solution to identify items for removal. Specifically, we removed items that did not load strongly on any factor (all loadings less than 0.3) and items that had high loadings on more than one factor.

Following this initial reduction of the item pool, further analysis with this exploratory subsample included evaluation of each dimension from the EFA with one-factor CFA models, and exploration of alternative factor structures, including the bifactor model (Gibbons and Hedeker, 1992), to better identify the loading patterns. In both cases, model fit indices and such criteria as root mean squared error of approximation (RMSEA) less than or equal to 0.08, Tucker–Lewis index (TLI) greater than or equal to 0.95, and comparative fit index (CFI) greater than or equal to 0.95 (Browne and Cudeck, 1993; Hu and Bentler, 1999) were examined. We also examined model modification indices from the CFA results to identify and remove items contributing to departures from unidimensionality. For example, two items with very similar item wording may display excess residual relationship with one another that is not accounted for by the model. These item clusters were identified and examined, and items were removed to minimize the excess dependence in the single factor solutions.

Once the dimensionality of the item pool was finalized, it was confirmed with a CFA model using the validation subsample.

Detecting Differential Item Functioning

Having determined the number of item banks (i.e., dimensionality of the pool) and identified a provisional set of items for each item bank, the next step was to apply an IRT-based approach to DIF evaluation using data from the entire sample. This was conducted for each bank separately. DIF analyses serve to identify problematic item bias associated with membership in a particular group (e.g., gender, race/ethnicity, service branch). A classic example of DIF is the symptom of crying to measure depression level. Women typically cry more easily (and thus perhaps more frequently) than men. Therefore, a response indicating frequent crying may indicate a more severe depression level if the respondent is a woman relative to if the respondent is a man. In cases where DIF is detected, scores computed for the different groups would not be comparable, thus these items should be removed from the final item bank to ensure that the bank of items yields comparable unbiased scores for the subgroups.

We examined DIF by race/ethnicity (Hispanic versus white versus black), gender (female versus male), relationship status (married or living with partner versus single or living alone), education (high school or less versus some college versus four-year college or more), service branch (Air Force versus Army versus Marine Corps versus Navy), officer versus enlisted status, component (active versus reserve/Guard), and deployment (ever been deployed for combat or other reasons versus not). The goal of DIF analysis was to eliminate any item bias toward these subgroups when using the final assessment tools. Because of the ordered categorical responses, we fitted Samejima's (1997) Graded Response Model to the entire sample. All DIF analyses were conducted with two-group model setups. For variables with more than two comparison groups, multiple pairwise comparison runs were conducted to thoroughly test for DIF within that grouping variable. For example, three pairwise models were fitted to the data to test race/ethnicity DIF, including (1) white versus black, (2) white versus Hispanic, and (3) black versus Hispanic.

We assessed DIF through three steps: (1) a two-stage procedure to test statistical significance of DIF, (2) quantification and visualization of severity or impact of DIF, and (3) a summary of results from the first two steps across each of the pairwise comparisons reflecting combined performance of each item. Items found to exhibit substantial bias based on these three steps were excluded from the final item banks. Next, we describe the three steps in detail.

First, initial screenings of DIF (e.g., to evaluate gender DIF) were tested by fitting two-group unidimensional models to the data. Item parameters were freely estimated across the two groups at this initial stage. Wald Chi-square DIF statistics from this model (Langer, 2008) significant at p values of 0.05 or less were used to identify anchor items and potential DIF items. In a second stage, the anchor items were used to "anchor" the two groups together via common parameter estimates and allowed for estimation of a stable overall group mean difference. The potential DIF items from the first stage were tested again for statistically significant DIF in this framework. We adjusted

the critical *p* values for the Chi-square statistics using the Benjamini-Hochberg procedure (Benjamini and Hochberg, 1995; Thissen, Steinberg, and Kuang, 2002) with an overall (familywise) alpha level of 0.01.

Second, based on results from the two-stage procedure, we obtained two sets of parameter estimates, one for each of the two groups for the candidate items. Although statistical significance would have been tested from the previous step, the size of the DIF (i.e., how much do the parameter estimates differ between the two groups for each item) was still unknown. The statistical test in the previous step was also very powerful, especially given the large sample size. As a result, DIF that was identified as statistically significant with the two-stage procedure could often be negligible in impact. Although we wanted to avoid problematic item bias in our banks, we also wanted to make sure the extent of bias was indeed problematic before deciding to remove an item.

To decide whether the statistically significant DIF identified was problematic, we used the weighted Area Between the expected score Curves (wABC) (Edelen, Stucky, and Chandra, 2015) as an index to quantify the size of DIF. We also plotted the expected score curves of each group using the computer software R so that the area between the two curves could provide visual representation of the size of DIF that corresponded to the values of wABC.

Finally, DIF analyses following the same approach in steps 1 and 2 were carried out for the other demographic variables, as well as the officer versus enlisted status, service branch, component, and deployment status groupings with a total of 17 pairwise comparisons. We combined results from the 17 pairwise comparisons and decided on three criteria to identify items with severe DIF that should be considered for removal from the final item bank: (1) the number of significant Chi-square tests with *p* values less than 0.01 (max = 17); (2) magnitude of maximum wABC values across the 17 comparisons; and (3) count of wABC values greater than 0.3 (max = 17). Although there was no clear rule of thumb regarding the cut point for wABC, these numeric values provided quantifiable information to help identify problematic items.

IRT Item Calibration and Model Fit Diagnostic

Removal of a final group of items based on results of the DIF analyses yielded a potential set of items as candidates for the final banks. The next step was to use IRT to calibrate the items in each bank to obtain psychometric performance information about each item (i.e., estimated item parameters). This information was used to select and score a short form for the barriers bank. With the estimated item parameters from the calibration process, we examined typical item properties, such as the item characteristic curve, the item and test information functions, and model fit.

Creating a Short Form

To minimize respondent burden, a short form was created from a subset of bank items by selecting the most informative items from a range of content areas. Selection was

designed to cover the conceptual breadth of the latent dimension while achieving good measurement precision across the distribution of respondents. We evaluated the psychometric properties of the short form by comparing reduction in score reliability when going from the complete item banks to the short form. We also plotted the test information curves to examine score precision across the distribution of respondents. Lastly, summed score to IRT scale score translation tables were provided to enable straightforward scoring of the short form on a *T*-score metric with a mean of 50 and a standard deviation of 10.

Preliminary Validity

To obtain preliminary validity evidence of the bank scores, we first used *T*-tests and regression analyses to evaluate differences in item bank/short-form scores according to age, gender, race/ethnicity, education, service branch, component, experience with the mental health system, and PTSD and depression diagnoses. We then examined correlations of the short-form and item bank scores we developed with three similar existing scales from the literature (two barriers-to-care scales from Hoge, Castro, et al. [2004] and Britt, Greene-Shortridge, et al. [2008] and the Male Role Norms Inventory Short Form from Levant, Hall, and Rankin [2013]). The magnitude of the correlations reflected the extent to which our bank scores measured unique content. To assess the effects of the disorder-specific items versus the general items, we examined item means and frequencies for the two sets of items that were represented as general, PTSD-specific, and depression-specific, and looked at the correlations among these items and between these items and other bank items.

Findings from Analyses of Field-Test Data

Descriptive Analysis

We examined the proportions in each response category for each item and confirmed that all item responses were distributed appropriately (i.e., no items with highly skewed distributions). We also examined the item-total correlations to verify the direction of coding. Among the 127 items (four disorder-specific items were excluded from the initial pool of 131 field-tested items), 18 items were found to have negative item-total correlations. Prior to factor analyses, these items with negative item-total correlations were reverse-scored so that for all items higher scores indicated more barriers to seeking care.

Factor Analyses

To explore the underlying dimensionality among the 127 items, the sample (i.e., 3,676 service members who completed the survey) was randomly split into two, one to conduct EFA and exploratory CFA and another to validate final dimensionality results with CFA. Although there were 20 eigenvalues greater than 1 from the EFA, examina-

tion of the scree plot showed that the biggest drop in eigenvalues was from one factor (51.45) to two factors (5.52), indicating the presence of an overwhelming primary factor. The remaining eigenvalues indicated the potential for up to two additional factors, as the next biggest drop was from three factors (4.81) to four factors (3.54). Based on the eigenvalues, we examined solutions for up to five factors. Our examination found that for both the four- and five-factor solutions, the fourth and fifth factors did not emerge as distinct in content, the interpretation of these factors was unclear, and there were few items that loaded strongly on them. Given the consistently strong loadings, distinct content, and clear interpretation of the pattern of factor loadings, we elected to evaluate the three-factor solution more closely. We recognize that prior research (e.g., Britt, Greene-Shortridge, et al., 2008) has found more-factorial distinctions among barrier items, but we favored a more parsimonious solution as recommended in the literature on EFA (Thompson and Daniel, 1996).

Examination of the three-factor EFA solution led to the identification of 22 items (of 131 items in the preliminary pool) that were not loading high on any of the three factors, so they were excluded from our subsequent analyses. We next estimated a three-factor CFA model, still using the exploratory subsample to evaluate fit of the reduced item set (number of items = 105). Fit for the three-factor CFA model was good (RMSEA = 0.04, where values less than 0.05 are considered good fit; CFI = 0.96 and TLI = 0.96, where values greater than 0.95 indicate good fit). A total of 76 items loaded strongly on the first factor (f1, loading range = 0.34–0.89), 19 loaded on the second factor (f2, loading range = 0.21–0.83), and 10 loaded on the third factor (f3, loading range = 0.35–0.74). The correlations among the three factors were high, especially between factors 1 and 2 (r = 0.77 between f1 and f2, 0.57 between f1 and f3, and 0.59 between f2 and f3), indicating that a more parsimonious factor structure might be more appropriate.

We then separately estimated each single factor from this three-factor solution with one-factor CFA models to further reduce the number of items. We examined item clustering (local dependence between pairs or groups of items) for each model based on modification indices and identified a total of 30 items from the three CFA models for removal. This procedure yielded a total of 77 remaining items (57 for factor 1, 13 for factor 2, and 7 for factor 3) to be further analyzed.

Given the high correlation among the three factors, we next specified a bifactor model (Gibbons and Hedeker, 1992) to better identify the loading patterns for the three factors and determine whether a subset of items specifically from factors 1 and 2 could be considered to comprise a single general factor. Based on results from the bifactor model, a total of 68 items from the original factors 1 and 2 were identified that reflected overall barriers to care (the barriers to care factor) and were retained for the first item bank. Another seven items were kept from the original factor 3 that were seen as unique content representing the positive or protective aspects (the facilitators of care factor).

Next, we confirmed the fit of these two single factor models using the validation subsample. Results for the barriers-to-care factor yielded excellent fit (RMSEA = 0.05; CFI = 0.97; and TLI = 0.96). For the facilitators of care factor, model fit was adequate, but results suggested deletion of an additional item with overlapping content. Model fit was excellent with the remaining six items kept for the facilitators of care factor (RMSEA = 0.05; CFI = 0.98; and TLI = 0.96).

With these two item sets as candidates for potential item banks, we fitted two unidimensional IRT models using the complete data set to separately evaluate their item characteristics for building each item bank. Two items that showed weak relationship with the other barriers to care items were further removed from this item pool. These IRT calibrations led to an item bank representing barriers to mental health care with 66 items (MR = 0.99) and a smaller six-item bank representing facilitators of mental health care (MR = 0.76).

Detecting Differential Item Functioning

IRT analyses were conducted to evaluate items for DIF in the barriers bank (66 items) with respect to race/ethnicity, gender, relationship status, education, service, officer versus enlisted status, component, and deployment.[1] The goal was to eliminate any item bias toward subgroups and to ensure comparable unbiased scores for the subgroups. All DIF analyses were carried out with two-group model setups (i.e., pairwise comparisons).

Tables D.1 to D.4 summarize results from the 17 pairwise comparisons between the subgroups of service (Table D.1), race/ethnicity (Table D.2), education (Table D.3), and other pairwise comparisons including gender, relationship status, officer versus enlisted status, deployment, and component (Table D.4) for the barriers bank. As previously mentioned, we looked at DIF across these 17 comparisons before removing any items (e.g., counting how many wABC values greater than 0.03, which are bolded in Tables D.1 to D.4). To identify problematic items, we first conducted Chi-square tests to identify items with p less than 0.05 and then calculated wABC for this subset of items. Items with no wABC value did not have a statistically significant difference during initial uncorrected Chi-square tests and are left blank in Tables D.1 to D.4. Next, we further corrected the p values using the Benjamini-Hochberg procedure and applied a more conservative filter ($p < 0.01$), leading to a smaller number of items with significant DIF. Those items with statistically significant DIF at an alpha level of 0.01 using Benjamini-Hochberg corrected p values are indicated with an asterisk in Tables D.1 to D.4.

[1] We were not able to conduct the full DIF analyses on the six items for the facilitators bank because the number of items was too limited to conduct a large number of tests. Instead, DIF was examined with respect to key variables, including service, gender, officer versus enlisted status, and component. Results of these analyses revealed no problematic DIF among the six items.

Table D.1
Differential Item Functioning Analyses to Investigate Group Differences Within Service Branch

Item Number	Army (*n* = 1,127) Versus Air Force (*n* = 1,129)		Army (*n* = 1,127) Versus Navy (*n* = 557)		Army (n = 1,127) Versus Marine Corps (*n* = 863)		Air Force (*n* = 1,129) Versus Navy (*n* = 557)		Air Force (*n* = 1,129) Versus Marine Corps (*n* = 863)		Navy (*n* = 557) Versus Marine Corps (*n* = 863)	
	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*
BTC2	0.13											
BTC7												
BTC11												
BTC13							0.16	*	0.15	*		
BTC14					0.05				0.12			
BTC16	0.14						0.09		0.13			
BTC17	0.09		0.15									
BTC19	0.04	*							0.08			
BTC20	0.10	*					0.14	*	0.10	*		
BTC21	0.28	*	0.23	*	0.18				0.10			
BTC22	0.09	*			0.09		0.05	*				
BTC24	0.29	*	0.15	*	0.20	*	0.40	*			0.32	*
BTC26	0.03	*			0.05		0.11	*	0.08			
BTC27												
BTC29							0.12	*				
BTC30	0.18	*	0.20	*	0.13		0.09					
BTC36	0.13				0.09							
BTC42	0.26	*							0.28	*		
BTC43	0.13											
BTC44												
BTC47	0.09				0.14							
BTC50	0.16								0.18			
BTC52	0.04	*					0.04		0.04			
BTC56	0.05	*					0.10					
BTC57												
BTC58	0.11				0.04		0.04		0.11		0.05	

Table D.1—Continued

Item Number	Army (*n* = 1,127) Versus Air Force (*n* = 1,129)		Army (*n* = 1,127) Versus Navy (*n* = 557)		Army (n = 1,127) Versus Marine Corps (*n* = 863)		Air Force (*n* = 1,129) Versus Navy (*n* = 557)		Air Force (*n* = 1,129) Versus Marine Corps (*n* = 863)		Navy (*n* = 557) Versus Marine Corps (*n* = 863)	
	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*
BTC60												
BTC64	0.26	*	**0.35**	*					0.20	*	0.29	*
BTC65												
BTC66	**0.38**	*					0.27	*	**0.39**	*		
BTC68	0.10											
BTC71												
BTC73	0.03				0.02		0.14	*	0.05			
BTC74					0.13				0.17		0.18	
BTC75									0.13			
BTC78					0.05							
BTC80					0.04							
BTC81					0.06				0.11			
BTC82												
BTC83									0.07			
BTC84			0.04	*			0.06	*			0.07	*
BTC85							0.00					
BTC88	0.10	*							0.10			
BTC90	**0.35**	*	0.19	*			0.14		0.26	*		
BTC91	0.07				0.11							
BTC96	0.13	*					0.10		0.08			
BTC97	0.05				0.05							
BTC103	0.11											
BTC104							0.09					
BTC105	0.11	*					0.11		0.09	*		
BTC106									0.20			
BTC108	0.10				0.09				0.02			
BTC109	0.08				0.02		0.03				0.04	

Table D.1—Continued

Item Number	Army (*n* = 1,127) Versus Air Force (*n* = 1,129)		Army (*n* = 1,127) Versus Navy (*n* = 557)		Army (n = 1,127) Versus Marine Corps (*n* = 863)		Air Force (*n* = 1,129) Versus Navy (*n* = 557)		Air Force (*n* = 1,129) Versus Marine Corps (*n* = 863)		Navy (*n* = 557) Versus Marine Corps (*n* = 863)	
	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*
BTC110												
BTC111												
BTC115	0.08											
BTC116	0.17	*					0.21	*	0.21	*		
BTC117	0.15	*							0.14			
BTC118	0.19	*					0.15		0.17	*		
BTC119	0.14	*							0.08			
BTC121												
BTC124												
BTC126												
BTC127							0.17					
BTC128	0.10				0.08		0.10					
BTC131					0.07							

NOTE: The wABC (Edelen, Stucky, and Chandra, 2015) was used as an index to quantify the size of DIF (with larger values reflecting more DIF). wABC values greater than 0.3 are bold. Those items with statistically significant DIF at an alpha level of 0.01 using Benjamini-Hochberg corrected *p* values are indicated with an asterisk. Items with no data did not exhibit any problematic DIF.

Table D.2
Differential Item Functioning Analyses to Investigate Group Differences Within Race/Ethnicity

	Black (*n* = 393) Versus White (*n* = 2,450)		Black (*n* = 393) Versus Hispanic (*n* = 437)		White (*n* = 2,450) Versus Hispanic (*n* = 437)	
Item Number	**wABC**	***p***	**wABC**	***p***	**wABC**	***p***
BTC2					0.12	
BTC7			0.16		0.09	
BTC11						
BTC13	0.12	*			0.19	*
BTC14						
BTC16						
BTC17			0.15		0.10	
BTC19	0.20					
BTC20					0.21	
BTC21					0.13	
BTC22	0.19	*	0.27	*	0.17	*
BTC24						
BTC26			0.07		0.13	*
BTC27						
BTC29	0.16		0.22		0.15	*
BTC30			0.23		0.20	*
BTC36	0.09	*	0.08		0.18	*
BTC42	0.27				0.09	
BTC43	0.17	*			0.17	*
BTC44	0.11	*	0.15		0.18	*
BTC47			0.15		0.12	
BTC50	0.26	*			0.26	*
BTC52			0.17		0.16	*
BTC56	0.04		0.17		0.24	*
BTC57			0.22		0.14	
BTC58	0.07		0.11		0.22	*
BTC60	0.11				0.22	*

Table D.2—Continued

	Black (*n* = 393) Versus White (*n* = 2,450)		Black (*n* = 393) Versus Hispanic (*n* = 437)		White (*n* = 2,450) Versus Hispanic (*n* = 437)	
Item Number	**wABC**	***p***	**wABC**	***p***	**wABC**	***p***
BTC64	0.21	*			**0.36**	*
BTC65			0.10		0.16	*
BTC66	0.19	*				
BTC68			0.14		0.27	*
BTC71	0.15		0.27		0.20	*
BTC73	0.17	*	0.08		**0.32**	*
BTC74					0.15	
BTC75			0.22		**0.37**	*
BTC78	0.14	*			0.23	*
BTC80					0.14	
BTC81	0.18	*	0.19			
BTC82	0.13		0.35		0.30	*
BTC83			0.15		0.29	*
BTC84	0.12	*	0.14		**0.32**	*
BTC85	0.16				0.27	*
BTC88	0.02	*	0.10		0.20	*
BTC90	0.25	*			0.08	*
BTC91	0.19	*			**0.31**	*
BTC96	0.17	*			0.10	*
BTC97			0.17		0.26	*
BTC103	0.11	*	0.16		0.17	
BTC104	0.20	*	0.26		0.13	
BTC105	0.17	*			**0.35**	*
BTC106	0.20	*				
BTC108	0.14		0.23		0.16	
BTC109			0.11		0.26	*
BTC110			0.21		0.30	*
BTC111			0.19		0.21	

Table D.2—Continued

	Black (*n* = 393) Versus White (*n* = 2,450)		Black (*n* = 393) Versus Hispanic (*n* = 437)		White (*n* = 2,450) Versus Hispanic (*n* = 437)	
Item Number	**wABC**	***p***	**wABC**	***p***	**wABC**	***p***
BTC115	0.16	*	0.23		0.15	
BTC116						
BTC117			0.16		0.11	
BTC118	0.25	*	**0.35**	*	0.18	
BTC119						
BTC121	0.20	*	0.13			
BTC124			0.10		0.24	*
BTC126	0.10	*	0.22		0.22	*
BTC127			0.14		**0.32**	*
BTC128			0.12		0.13	
BTC131			0.22		0.28	*

NOTE: The wABC (Edelen, Stucky, and Chandra, 2015) was used as an index to quantify the size of DIF (with larger values reflecting more DIF). wABC values greater than 0.3 are bold. Those items with statistically significant DIF at an alpha level of 0.01 using Benjamini-Hochberg corrected *p* values are indicated with an asterisk. Items with no data did not exhibit any problematic DIF.

Table D.3
Differential Item Functioning Analyses to Investigate Group Differences Within Levels of Education

	High School (*n* = 521) Versus Some College (*n* = 1,340)		High School (*n* = 521) Versus Four-Year College or Above (*n* = 1,806)		Some College (*n* = 1,340) Versus Four-Year College or Above (*n* = 1,806)	
Item Number	**wABC**	***p***	**wABC**	***p***	**wABC**	***p***
BTC2	0.18	*	**0.34**	*	0.13	
BTC7	0.16		0.20	*	0.02	
BTC11	0.14		0.24	*	0.09	*
BTC13	0.21		0.22	*	0.07	
BTC14	0.24		**0.34**	*	0.08	*
BTC16	**0.31**	*	0.18	*	0.17	
BTC17	0.12		0.20	*	0.07	
BTC19	0.17		0.18		0.08	
BTC20	**0.40**	*	**0.54**	*	0.10	*
BTC21			0.23	*	0.22	*
BTC22	**0.31**	*	**0.35**	*	0.03	*
BTC24			0.25	*	0.23	
BTC26	**0.32**	*	**0.43**	*	0.07	*
BTC27	**0.38**	*	**0.43**	*		
BTC29	**0.39**	*	**0.37**	*	0.10	*
BTC30	0.18		0.16		0.14	*
BTC36	0.19	*	0.18	*	0.06	
BTC42			0.29	*	0.21	
BTC43	0.14		0.09	*	0.20	*
BTC44	0.11		0.19	*		
BTC47	0.11		0.08	*	0.07	
BTC50			0.19	*	0.24	*
BTC52	0.15		0.11	*	0.08	
BTC56	0.29	*	**0.35**	*	0.02	*
BTC57	0.18				0.20	
BTC58	0.22	*	0.20	*	0.07	

Table D.3—Continued

	High School (*n* = 521) Versus Some College (*n* = 1,340)		High School (*n* = 521) Versus Four-Year College or Above (*n* = 1,806)		Some College (*n* = 1,340) Versus Four-Year College or Above (*n* = 1,806)	
Item Number	**wABC**	***p***	**wABC**	***p***	**wABC**	***p***
BTC60	0.19		0.14		0.08	
BTC64	0.18		0.24	*		
BTC65	0.23	*	0.08		0.19	
BTC66			**0.34**	*	0.25	
BTC68	0.16	*	0.24	*		
BTC71	0.13	*	0.14	*		
BTC73	0.27	*	**0.32**	*		
BTC74	0.13		0.26	*	0.10	*
BTC75	0.10		0.15	*	0.08	
BTC78	0.17		0.12		0.09	
BTC80					0.17	
BTC81	0.18		0.17			
BTC82	**0.49**	*	**0.58**	*		
BTC83	0.23	*	0.15		0.12	
BTC84	0.25	*	**0.36**	*	0.07	*
BTC85	0.22		0.21	*	0.05	
BTC88	0.23	*	0.24	*		
BTC90			0.29	*	0.23	*
BTC91	**0.39**	*	**0.47**	*	0.04	
BTC96			0.29	*	0.28	*
BTC97	**0.36**	*	**0.37**	*		
BTC103	0.20	*	0.12	*	0.12	
BTC104	0.14	*	0.02	*	0.17	*
BTC105	0.22	*	0.23	*	0.09	
BTC106	0.14		0.17		0.09	
BTC108	0.05				0.09	
BTC109	0.24	*	0.24	*	0.07	

Table D.3—Continued

	High School (*n* = 521) Versus Some College (*n* = 1,340)		High School (*n* = 521) Versus Four-Year College or Above (*n* = 1,806)		Some College (*n* = 1,340) Versus Four-Year College or Above (*n* = 1,806)	
Item Number	**wABC**	***p***	**wABC**	***p***	**wABC**	***p***
BTC110	0.23	*	0.20	*	0.08	
BTC111	**0.35**	*	**0.40**	*	0.02	*
BTC115	0.21	*	0.12	*	0.14	
BTC116			0.26	*	0.24	*
BTC117	0.16		0.08		0.12	
BTC118	0.09				0.14	*
BTC119			0.23	*	0.22	*
BTC121	0.14				0.13	
BTC124	0.11		0.15			
BTC126	0.26	*	0.29	*		
BTC127	0.27	*	**0.36**	*		
BTC128	0.13	*	0.05	*	0.22	*
BTC131	0.29	*	0.29	*	0.05	

NOTE: The wABC (Edelen, Stucky, and Chandra, 2015) was used as an index to quantify the size of DIF (with larger values reflecting more DIF). wABC values greater than 0.3 are bolded. Those items with statistically significant DIF at an alpha level of 0.01 using Benjamini-Hochberg corrected *p* values are indicated with an asterisk. Items with no data did not exhibit any problematic DIF.

Table D.4
Differential Item Functioning Analyses to Investigate Group Differences in Gender, Relationship Status, Officer Versus Enlisted Status, Deployment, and Component

Item Number	Gender: Males (*n* = 3,197) Versus Females (n = 467)		Relationship Status: Married/ Living with Partner (*n* = 2,622) Versus Not (*n* = 1,019)		Officer Versus Enlisted Status: Enlisted (*n* = 2,401) Versus Officer (*n* = 1,191)		Deployment: No (*n* = 583) Versus Yes (*n* = 2,955)		Component: Inactive (*n* = 311) Versus Active (*n* = 3,324)	
	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*
BTC2					0.11	*	0.09			
BTC7										
BTC11	0.17				0.08	*			0.10	
BTC13	0.20				0.04	*			0.23	
BTC14			0.06		0.07		0.17			
BTC16					0.16	*				
BTC17					0.07		0.15	*		
BTC19	0.27	*								
BTC20			0.13	*	0.17	*	0.12		0.12	
BTC21	0.16				0.24	*				
BTC22			0.07	*	0.05	*	0.03			
BTC24			0.27	*	0.29	*	**0.35**	*		
BTC26			0.09	*	0.10	*	0.05	*		
BTC27	**0.33**	*								
BTC29	**0.38**	*			0.12	*				
BTC30	0.18	*			0.13	*	0.18			
BTC36			0.07		0.05	*	0.10	*		
BTC42	0.26	*	0.04		0.24	*				
BTC43	0.17		0.12	*	0.20	*				
BTC44	0.15				0.02		0.04			
BTC47	0.03				0.08	*	0.13			
BTC50					0.21	*			0.16	
BTC52					0.07		0.11			
BTC56			0.06	*	0.06	*	0.05		0.07	
BTC57					0.21	*				

Table D.4—Continued

Item Number	Gender: Males (*n* = 3,197) Versus Females (n = 467)		Relationship Status: Married/ Living with Partner (*n* = 2,622) Versus Not (*n* = 1,019)		Officer Versus Enlisted Status: Enlisted (*n* = 2,401) Versus Officer (*n* = 1,191)		Deployment: No (*n* = 583) Versus Yes (*n* = 2,955)		Component: Inactive (*n* = 311) Versus Active (*n* = 3,324)	
	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*
BTC58	0.12	*			0.05	*	0.03		0.10	
BTC60									0.17	
BTC64					0.14	*				
BTC65			0.09		0.24	*				
BTC66	0.22	*	0.25	*	0.30	*	0.23	*		
BTC68					0.08		0.07	*		
BTC71					0.09		0.13		0.08	
BTC73					0.03				0.12	
BTC74					0.16	*	0.19			
BTC75	0.19	*	0.13	*	0.08					
BTC78			0.02		0.07		0.02		0.11	
BTC80			0.13	*	0.20	*	0.26	*		
BTC81	0.28	*	0.16	*	0.07	*	0.24	*		
BTC82	**0.38**	*			0.20	*				
BTC83			0.08		0.08	*			0.27	*
BTC84			0.14	*	0.10	*				
BTC85					0.01	*			0.04	
BTC88									0.08	
BTC90	**0.38**	*			0.24	*				
BTC91					0.11	*	0.07		0.15	
BTC96	0.13				**0.32**	*	0.20	*		
BTC97			0.09	*					0.08	
BTC103					0.13	*				
BTC104	0.13				0.19	*	0.09			
BTC105					0.07	*			0.22	
BTC106									0.24	

Table D.4—Continued

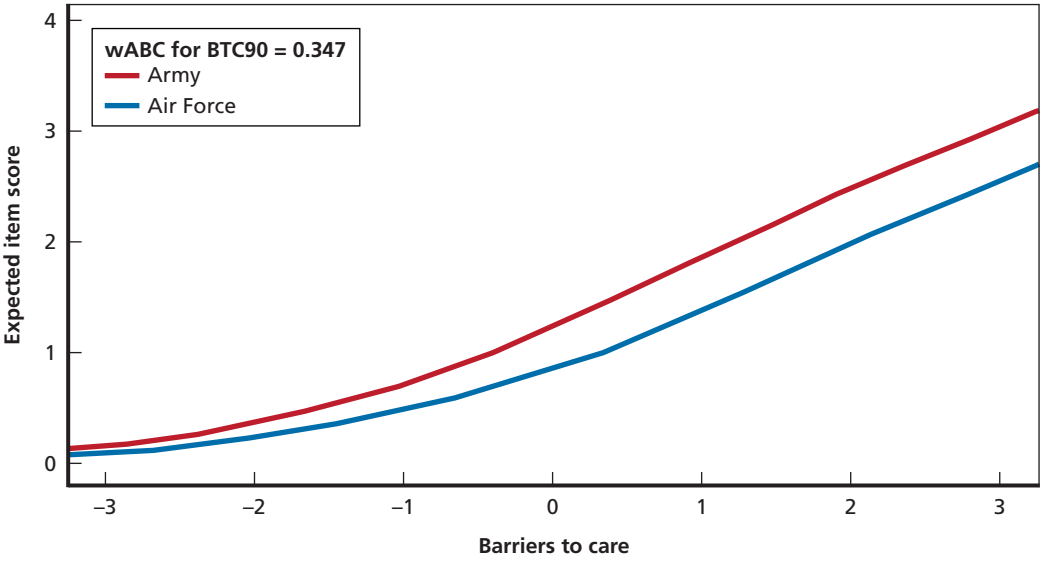
Item Number	Gender: Males (*n* = 3,197) Versus Females (n = 467)		Relationship Status: Married/ Living with Partner (*n* = 2,622) Versus Not (*n* = 1,019)		Officer Versus Enlisted Status: Enlisted (*n* = 2,401) Versus Officer (*n* = 1,191)		Deployment: No (*n* = 583) Versus Yes (*n* = 2,955)		Component: Inactive (*n* = 311) Versus Active (*n* = 3,324)	
	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*	wABC	*p*
BTC108	0.15	*			0.12	*	0.10			
BTC109									0.12	
BTC110	0.03						0.04	*	0.05	
BTC111	0.09		0.09		0.04	*	0.09	*	0.10	
BTC115	0.10				0.13	*	0.11			
BTC116	0.16		0.08		0.26	*	0.18			
BTC117					0.12		0.06			
BTC118	0.18	*			0.17	*				
BTC119	0.12				0.20	*	0.09			
BTC121	0.07		0.09		0.13	*	0.14			
BTC124	0.12									
BTC126										
BTC127	0.14		0.05	*	0.11				0.16	
BTC128					0.26	*	0.05	*	0.08	
BTC131			0.03							

NOTE: The wABC (Edelen, Stucky, and Chandra, 2015) was used as an index to quantify the size of DIF (with larger values reflecting more DIF). wABC values greater than 0.3 are bolded. Those items with statistically significant DIF at an alpha level of 0.01 using Benjamini-Hochberg corrected *p* values are indicated with an asterisk. Items with no data did not exhibit any problematic DIF.

We also plotted and examined the expected score curves by group for items with potential DIF to illustrate the magnitude and location of the DIF across the score continuum (Figures D.2 to D.6 illustrate DIF according to service [Figure D.2], education [Figure D.3], gender [Figure D.4], officer versus enlisted status [Figure D.5], and deployment [Figure D.6]). The item characteristic curve examines the performance of an item by assessing the probability that a respondent will answer an item a specific way, given certain characteristics (e.g., gender) (Edelen and Reeve, 2007). The area between the two curves in each figure provides a visual representation of the size of DIF. For example, BTC29 (If I had mental health problems, I worry that people who knew would tell others) from Figure D.4 has an expected score curve for the female group (the red line) that is above the male group (the blue line) at all levels of barriers to care, suggesting that this item would be more likely to be endorsed by women than men.

Figure D.2
wABC to Show Service Branch Differential Item Functioning, Army Versus Air Force

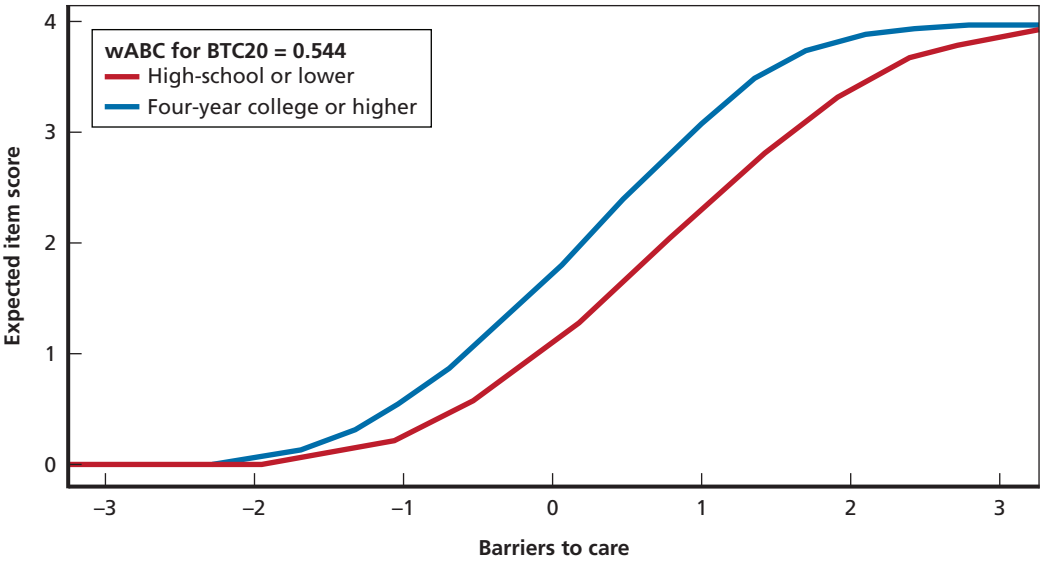
Item #90: Many people with mental health problems don't try hard enough to get better on their own.



RAND *RR1762-D.2*

Figure D.3
wABC to Show Levels of Education Differential Item Functioning, Those with High School or Less Education Versus Those with Four-Year College Degree or More

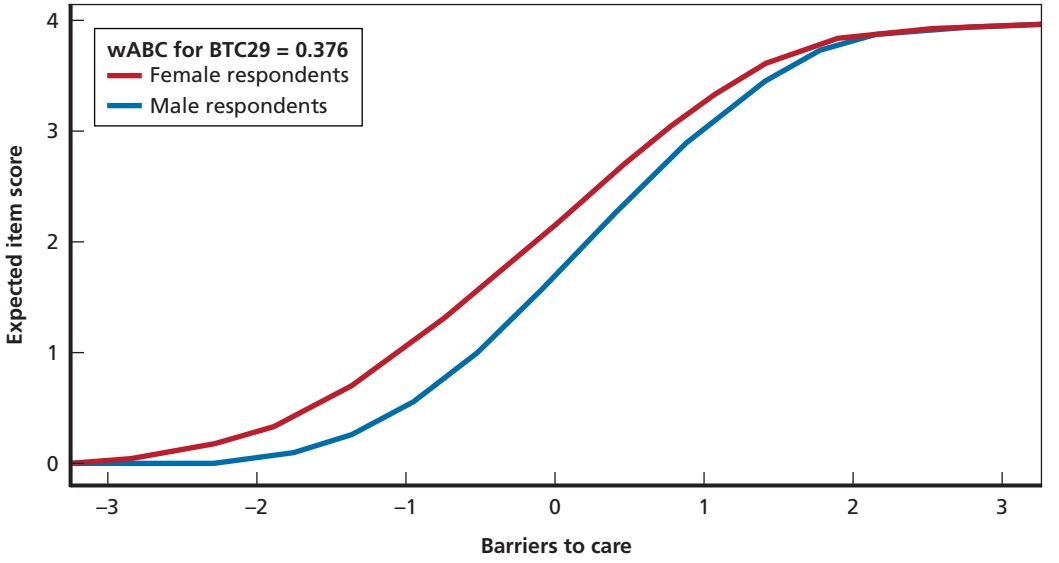
Item #20: If I had mental health problems, I would be concerned that others would find out if I went for professional help.



RAND *RR1762-D.3*

Figure D.4
wABC to Show Gender Differential Item Functioning, Male Versus Female

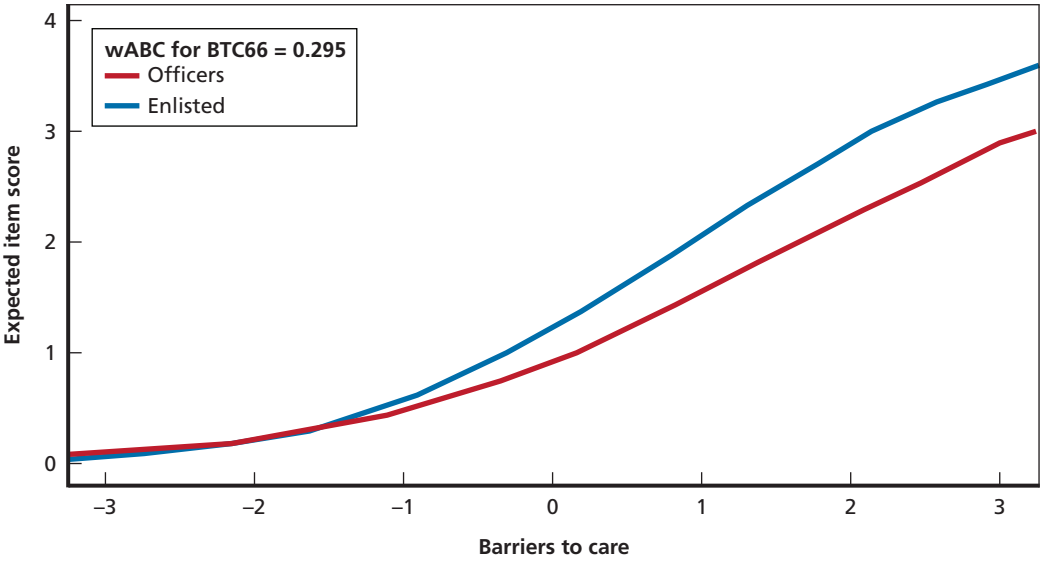
Item #29: If I had mental health problems, I worry that people who knew would tell others.



RAND *RR1762-D.4*

Figure D.5
wABC to Show Officer Versus Enlisted Status Differential Item Functioning

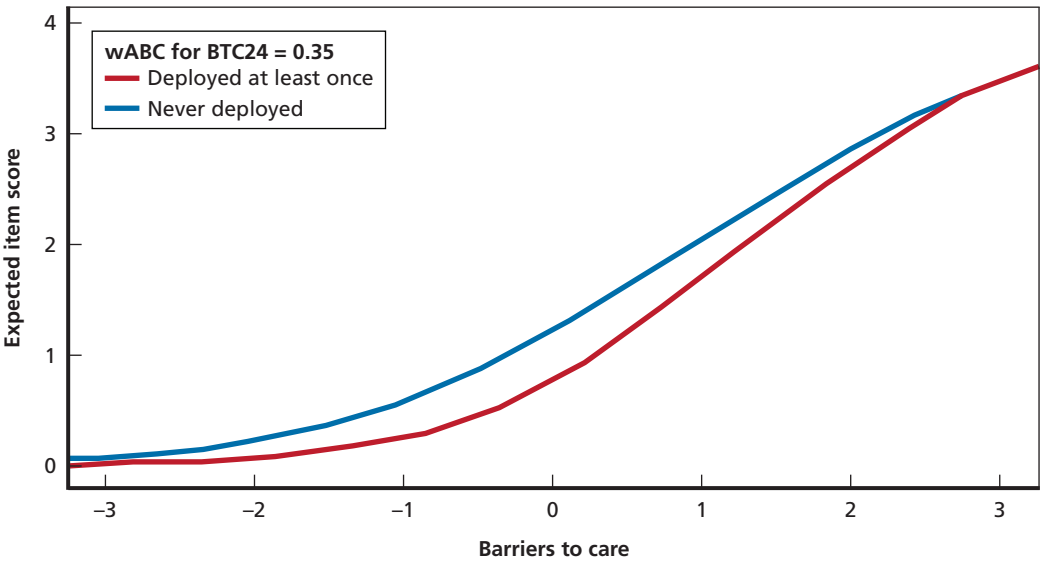
Item #66: If I had mental health problems, I would not seek professional help because I would not want to take professional resources away from other service members with more serious physical disabilities.



RAND *RR1762-D.5*

Figure D.6
Weighted Area Between the Expected Score Curves (wABC) to Show Deployment Differential Item Functioning (Comparing Those Who Have Deployed at Least Once Versus Those Who Have Never Deployed)

Item #24: If I were having mental health problems, I might be discharged if my unit leadership found out about it.



RAND *RR1762-D.6*

From the set of 66 items that measures the barriers to care factor, 12 items were judged to have nonignorable DIF based on these criteria and were removed from the item bank (see items in Table D.5), leaving a total of 54 items for the barriers bank.

IRT Item Calibration and Model Fit Diagnostic

We conducted separate IRT calibrations of the items in the barriers and facilitators banks using data from the entire sample. An IRT model characterizes the relationship between an individual's response to an item and his or her standing on the latent trait being measured. That is, the model defines the probability that a person with a certain latent trait level will endorse a given response option. The characterization is usually modeled as a logistic function with a varying number of parameters depending on the type of item being modeled. In the simplest case of a yes/no item, the IRT model estimates a slope or discrimination parameter, which can be thought of similarly to an item-total correlation or factor loading, and a location or difficulty parameter, which can be thought of similarly to the probability of a correct response. For items with more than two response categories, a series of threshold parameters, similar to ordered logits, are added to estimate the probability of responding in each category.

Table D.5
Summary of 17 Pairwise Analyses Evaluating Differential Item Functioning in the Barriers to Mental Health Care Bank Items with Respect to Service, Race/Ethnicity, Education, Gender, Relationship Status, Officer Versus Enlisted Status, Deployment, and Component

Item Number	Wording	Max ABC Value	Count wABC > 0.3	Count $p < 0.01$
BTC82	If I had a mental health problem, I would be very careful about who I told about it.	0.58	4	5
BTC20	If I had mental health problems, I would be concerned that others would find out if I went for professional help.	0.54	2	8
BTC22	People would judge me poorly if they knew I had sought professional help for mental health problems.	0.35	2	10
BTC91	I would feel embarrassed if others knew I was seeking professional help for mental health problems.	0.47	3	5
BTC26	If I had mental health problems, I would worry that people may judge me when they found out.	0.43	2	9
BTC27	If I had mental health problems, I would only seek professional help if I were certain that my command would not be able to find out the details.	0.43	3	3
BTC24	If I were having mental health problems, I might be discharged if my unit leadership found out about it.	0.4	3	9
BTC29	If I had mental health problems, I worry that people who knew would tell others.	0.39	3	7
BTC66	If I had mental health problems, I would not seek professional help because I would not want to take professional resources away from other service members with more serious physical disabilities.	0.39	3	9
BTC90	Many people with mental health problems don't try hard enough to get better on their own.	0.38	2	9
BTC64	I do not want to appear weaker than my peers.	0.36	2	8
BTC84	I would lose the respect of other service members if they found out I was receiving professional help for my mental health problems.	0.36	2	10

NOTE: The wABC is an index representing the weighted (by the normal distribution) area between the two IRT-based item characteristic curves. It can be used to characterize the extent of discrepancy between two curves because of DIF. Larger wABC values indicate a higher degree of DIF. Items with significant DIF were those items with two or more wABC values greater than 0.3 (as reflected in the column Count wABC > 0.3) or items with more than seven significant DIF scores, as reflected in the column Count ($p < 0.01$).

Because of the ordered categorical responses, we fitted Samejima's (1997) Graded Response Model—a model for ordered categorical item responses that is often used in health-related item modeling. Once the item parameters were obtained, we examined typical item properties, such as the item parameter estimates (Tables D.6 and D.7).

Results showed very good calibration of the barriers bank and excellent model fit (RMSEA = 0.00). The MR was 0.98 for the 54-item bank. Because of its limited number of items, the facilitators bank (bank 2) had a lower MR (0.76) and worse, but still acceptable model fit (RMSEA = 0.13) relative to the barriers bank.

Creating a Short Form

Because there were just six items in the facilitators bank, we did not need to further construct a short form. For the barriers bank, we further reduced the number of items from 54 to 15. We selected 15 items because it allowed us to take into consideration items that were most informative at each level of the latent continuum, as well as balancing good content coverage. Because of the fewer items, the test information curve (Figure D.7) peaked over 30 in the middle range of the latent trait, which is lower than the peak over 90 observed for the full barriers bank.

Despite reducing the number of items from 54 in the barriers bank to 15 in the short form, the MR of the barriers short-form scores remained quite good (0.95). In addition, these scores correlated strongly (0.97) with those obtained from the complete barriers bank. The results suggested that the 15-item short form provided an efficient and reliable measure of barriers to mental health care.

For the convenience of scoring, we created a short-form scoring table (Table D.8) based on the sum of the coded responses over the items in the short form. This table can be used to convert scores on the short form to an IRT scale score. This IRT scale score can be calculated for any combination of items from the item bank or when using the total item bank to provide a standardized way to compare across administrations of the item bank that use varied items. The first column in Table D.8 shows the short-form summed score. There are 15 items on the barriers short form, and using a five-point Likert scale from 0–4, respondents can get a maximum score of 60. The second column shows the IRT scale score. The third column shows the standard error (in a *T*-score metric) that corresponds to reliability (a standard error of 3 yields a reliability greater than 0.90). The summed score to scale score conversion table might suffer from minor loss in precision, but scoring is simplified. We generated a similar score conversion table for the six-item facilitators bank (Table D.9). In both cases, IRT scale scores were placed on a *T*-score metric with mean of 50 and standard deviation of 10.

A summary of the analyses of preliminary validity and associated findings can be found in Chapter Four.

Table D.6
Item Bank Calibration for the 54-Item Barriers to Mental Health Care Item Bank

Item Number	*a*	*s.e.*	*b1*	*s.e.*	*b2*	*s.e.*	*b3*	*s.e.*	*b4*	*s.e.*
BTC2	1.60	0.05	−0.95	0.05	0.02	0.03	0.98	0.04	1.96	0.06
BTC7	1.58	0.06	−0.22	0.04	0.73	0.04	1.85	0.06	2.79	0.10
BTC11	1.56	0.05	−1.25	0.05	−0.23	0.03	0.69	0.04	1.57	0.05
BTC13	1.28	0.05	−0.80	0.05	0.16	0.04	1.08	0.05	1.86	0.07
BTC14	1.30	0.05	−1.40	0.06	−0.53	0.04	0.35	0.04	1.19	0.05
BTC16	2.21	0.07	−0.50	0.03	0.20	0.03	0.85	0.03	1.53	0.04
BTC17	1.82	0.07	0.15	0.03	0.89	0.03	1.63	0.05	2.34	0.08
BTC19	1.05	0.04	−2.10	0.09	−0.84	0.05	0.48	0.04	1.53	0.07
BTC21	1.10	0.05	0.22	0.04	1.33	0.06	2.75	0.12	3.72	0.17
BTC30	1.94	0.07	−0.03	0.03	0.65	0.03	1.30	0.04	1.96	0.06
BTC36	2.75	0.08	−0.72	0.03	0.14	0.02	0.86	0.03	1.54	0.04
BTC42	1.09	0.05	−0.30	0.05	0.32	0.04	1.34	0.06	2.34	0.10
BTC43	1.74	0.06	0.18	0.03	0.94	0.04	1.80	0.06	2.48	0.08
BTC44	2.15	0.07	−0.94	0.04	0.06	0.03	0.94	0.03	1.80	0.05
BTC47	1.87	0.07	0.32	0.03	1.15	0.04	2.01	0.06	2.76	0.10
BTC50	1.70	0.06	−0.91	0.04	0.01	0.03	0.86	0.04	1.67	0.05
BTC52	2.24	0.07	−0.82	0.04	0.39	0.03	1.33	0.04	2.21	0.06
BTC56	2.92	0.09	−0.67	0.03	0.22	0.02	0.91	0.03	1.68	0.04
BTC57	1.61	0.06	−0.22	0.03	0.51	0.03	1.35	0.05	2.23	0.08
BTC58	3.49	0.11	−0.53	0.03	0.30	0.02	0.91	0.02	1.52	0.03
BTC60	1.22	0.05	−2.13	0.09	−0.78	0.05	0.47	0.04	1.72	0.07
BTC65	1.32	0.05	−1.05	0.05	0.03	0.04	1.17	0.05	2.23	0.08
BTC68	2.92	0.09	−1.12	0.04	−0.09	0.03	0.62	0.02	1.32	0.03
BTC71	2.84	0.09	−0.88	0.04	0.13	0.02	0.95	0.03	1.67	0.04
BTC73	2.87	0.09	−0.51	0.03	0.27	0.02	0.98	0.03	1.68	0.04
BTC74	2.27	0.07	−0.84	0.04	−0.09	0.03	0.55	0.03	1.16	0.04
BTC75	2.10	0.07	−0.79	0.04	0.12	0.03	0.93	0.03	1.78	0.05
BTC78	2.70	0.08	−0.42	0.03	0.35	0.02	1.03	0.03	1.66	0.04
BTC80	2.15	0.07	−0.27	0.03	0.64	0.03	1.50	0.04	2.27	0.07
BTC81	2.03	0.07	−0.08	0.03	0.44	0.03	1.02	0.03	1.59	0.05

Table D.6—Continued

Item Number	*a*	*s.e.*	*b1*	*s.e.*	*b2*	*s.e.*	*b3*	*s.e.*	*b4*	*s.e.*
BTC83	2.08	0.07	–0.81	0.04	0.10	0.03	0.85	0.03	1.59	0.05
BTC85	2.22	0.07	–1.03	0.04	–0.14	0.03	0.50	0.03	1.18	0.04
BTC88	3.50	0.11	–0.80	0.03	0	0.02	0.66	0.02	1.31	0.03
BTC96	1.42	0.06	0.73	0.04	1.60	0.06	2.79	0.11	3.43	0.15
BTC97	4.06	0.13	–0.61	0.03	0.30	0.02	0.94	0.02	1.51	0.03
BTC103	2.68	0.08	–0.67	0.03	0.29	0.02	1.10	0.03	1.80	0.05
BTC104	3.01	0.09	–0.56	0.03	0.47	0.02	1.31	0.03	2.00	0.05
BTC105	2.16	0.07	–0.82	0.04	0.06	0.03	0.80	0.03	1.56	0.04
BTC106	1.49	0.05	–0.78	0.05	0.14	0.03	1.02	0.04	1.98	0.07
BTC108	2.69	0.09	–0.32	0.03	0.66	0.03	1.51	0.04	2.23	0.06
BTC109	3.61	0.11	–0.51	0.03	0.25	0.02	0.84	0.02	1.44	0.03
BTC110	4.08	0.13	–0.63	0.03	0.28	0.02	0.90	0.02	1.50	0.03
BTC111	3.38	0.10	–0.82	0.03	0.10	0.02	0.74	0.02	1.33	0.03
BTC115	3.49	0.11	–0.61	0.03	0.41	0.02	1.08	0.03	1.72	0.04
BTC116	1.03	0.05	–1.07	0.07	0.46	0.05	2.35	0.10	3.79	0.18
BTC117	2.46	0.08	–0.48	0.03	0.38	0.03	1.09	0.03	1.76	0.05
BTC118	2.44	0.08	–0.48	0.03	0.56	0.03	1.30	0.04	2.01	0.06
BTC119	1.25	0.07	1.43	0.06	2.08	0.09	3.16	0.15	4.02	0.22
BTC121	2.16	0.08	0.05	0.03	0.65	0.03	1.21	0.04	1.87	0.06
BTC124	2.37	0.07	–0.87	0.04	0.19	0.03	0.94	0.03	1.74	0.05
BTC126	2.80	0.09	–0.83	0.04	0.21	0.02	0.95	0.03	1.66	0.04
BTC127	2.94	0.09	–0.61	0.03	0.18	0.02	0.78	0.03	1.39	0.04
BTC128	2.96	0.10	–0.11	0.03	0.61	0.02	1.28	0.03	1.86	0.05
BTC131	3.10	0.10	–0.56	0.03	0.29	0.02	0.88	0.03	1.45	0.04

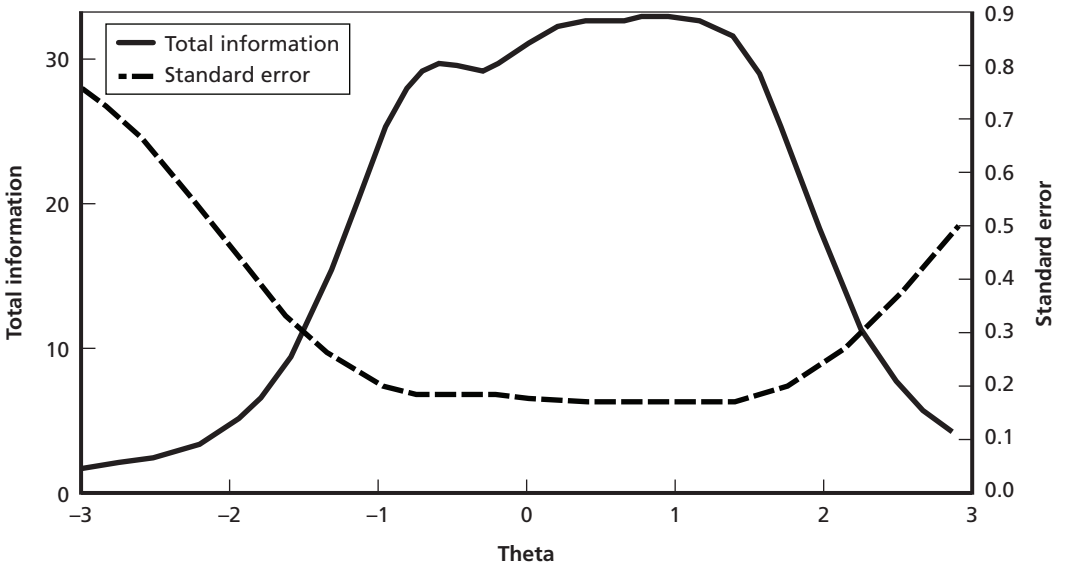
NOTE: *a* is the estimated slope parameter with standard error estimates (indicated by *s.e.*) representing item discrimination. The four *b* parameters represent the estimated category threshold parameters that correspond to the point along the latent trait scale at which a respondent has a 0.50 probability of responding above the threshold. Because we have five categories (not at all, a little bit, somewhat, quite a bit, very much), we have four estimated thresholds (*b1*, *b2*, *b3*, and *b4*), each with estimated standard errors. Items with higher slope parameters are more strongly related to the construct being measured (analogous to items with higher loadings in factor analysis or higher item–total correlations in classical analysis). The spread of the location parameters indicates where along the continuum the item is most useful. Items with locations mostly above the mean would be most useful for assessing individuals with higher levels of the construct being measured.

Table D.7
Item Bank Calibration for the Six-Item Facilitators of Mental Health Care Item Bank

Item Number	*a*	*s.e.*	*b1*	*s.e.*	*b2*	*s.e.*	*b3*	*s.e.*	*b4*	*s.e.*
BTC114	1.41	0.07	–1.37	0.06	–0.46	0.04	0.58	0.04	1.84	0.08
BTC122	1.61	0.08	–0.88	0.05	0.23	0.03	1.3	0.06	2.56	0.11
BTC46	1.03	0.06	–1.86	0.10	–0.85	0.06	0.46	0.05	1.96	0.10
BTC129	1.21	0.06	–1.75	0.08	–0.48	0.04	0.83	0.05	2.00	0.09
BTC49	1.82	0.11	–0.08	0.03	1.11	0.05	2.05	0.08	2.99	0.14
BTC33	1.27	0.07	–0.13	0.04	1.05	0.06	2.36	0.11	3.32	0.17

NOTE: *a* is the estimated slope parameter with standard error estimates (indicated by *s.e.*) representing item discrimination. The four *b* parameters represent the estimated category threshold parameters that correspond to the point along the latent trait scale at which a respondent has a 0.50 probability of responding above the threshold. Because we have five categories (not at all, a little bit, somewhat, quite a bit, very much), we have four estimated thresholds (*b1*, *b2*, *b3*, and *b4*), each with estimated standard errors. Items with higher slope parameters are more strongly related to the construct being measured (analogous to items with higher loadings in factor analysis or higher item-total correlations in classical analysis). The spread of the location parameters indicates where along the continuum the item is most useful. Items with locations mostly above the mean would be most useful for assessing individuals with higher levels of the construct being measured.

Figure D.7
Test Information Curve for the 15-Item Barriers to Mental Health Care Short Form



NOTE: Standard error curve indicates less precision at the tails of the latent continuum.

RAND *RR1762-D.7*

Table D.8

Conversion Table for Scoring the 15-Item Barriers to Mental Health Care Short Form

Summed Score	IRT Scale Score	SD[$\theta|x$]
0	28	5
1	31	4
2	33	4
3	35	4
4	37	3
5	38	3
6	39	3
7	40	3
8	41	2
9	42	2
10	43	2
11	44	2
12	44	2
13	45	2
14	46	2
15	46	2
16	47	2
17	48	2
18	48	2
19	49	2
20	50	2
21	50	2
22	51	2
23	51	2
24	52	2
25	52	2
26	53	2
27	54	2

Table D.8—Continued

Summed Score	IRT Scale Score	SD[$\theta|x$]
28	54	2
29	55	2
30	55	2
31	56	2
32	56	2
33	57	2
34	57	2
35	58	2
36	58	2
37	59	2
38	59	2
39	60	2
40	60	2
41	61	2
42	61	2
43	62	2
44	63	2
45	63	2
46	64	2
47	64	2
48	65	2
49	66	2
50	66	2
51	67	2
52	68	3
53	69	3
54	70	3
55	71	3
56	72	3

Table D.8—Continued

Summed Score	IRT Scale Score	SD[$\theta|x$]
57	74	4
58	75	4
59	77	4
60	79	5

NOTE: Responses are on a 0–4 five-category scale. IRT scale scores have a mean of 50 and standard deviation of 10.

Table D.9
Conversion Table for Scoring the Six-Item Facilitators of Mental Health Care Item Bank

Summed Score	IRT Scale Score	SD[$\theta|x$]
0	30	6
1	34	6
2	37	6
3	39	6
4	41	5
5	43	5
6	45	5
7	47	5
8	49	5
9	50	5
10	52	5
11	54	5
12	56	5
13	57	5
14	59	5
15	61	5
16	62	5
17	64	5
18	66	5
19	68	5

Table D.9—Continued

Summed Score	IRT Scale Score	SD[$\theta|x$]
20	70	5
21	72	5
22	74	5
23	77	5
24	80	6

NOTE: Responses are on a 0–4 five-category scale. IRT scale scores have a mean of 50 and standard deviation of 10.

APPENDIX E

Methods Used to Develop Options for Utilizing the Item Banks

To complete step 5 (Figure E.1), we asked 20 experts for their feedback on the best possible uses for the item banks based on their expertise running large-scale surveys or conducting large survey research or public health surveillance projects. Specifically, we asked experts to describe what worked well and what pitfalls to avoid in data collection, system design, and dissemination.

Identifying Experts

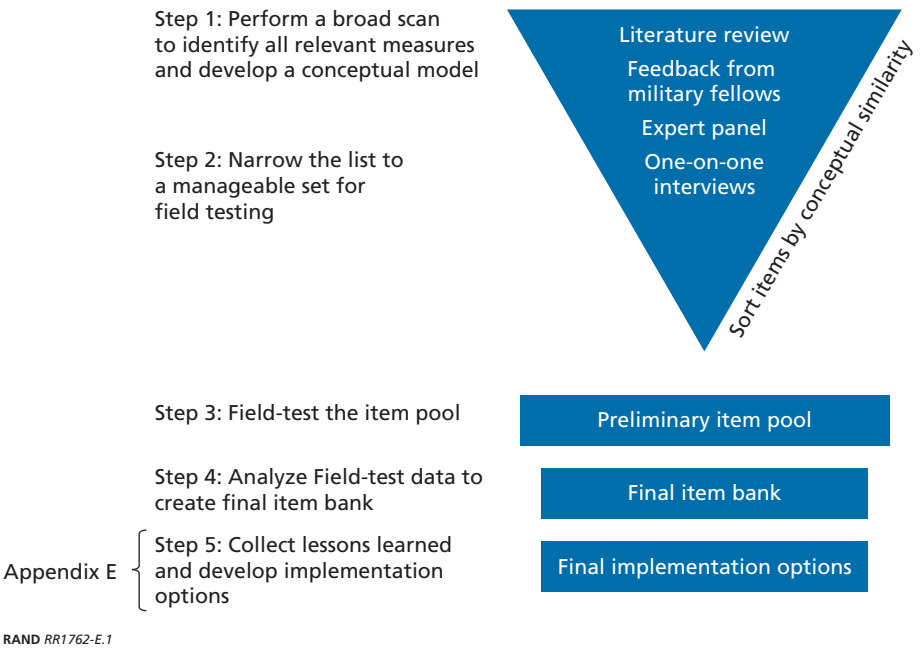
We identified experts from DoD-affiliated entities running large surveys of military personnel, as well as experts with experience in population-level mental health-related surveys of civilians, service members, or veterans. In addition, we interviewed experts in military mental health or mental health survey methodology.

Experts Running Large Military Surveys

The **Defense Equal Opportunity Management Institute (DEOMI) Research Directorate** supports DEOMI, the services, and the Office of the Secretary of Defense by providing operational support to commanders via climate assessments, and conducts basic and applied research addressing emerging topics, among other tasks. Specifically, the directorate is responsible for the Organizational Climate Survey, the Defense Diversity Management Climate Survey, and the Federal Organizational Climate Survey. We spoke to LCDR Loring John Crepeau, the chief scientist for the DEOMI Research Directorate.

The **Armed Forces Health Surveillance Center** is the central epidemiologic resource for the U.S. armed forces. It maintains the Defense Medical Surveillance System and the Defense Medical Epidemiology Database and publishes the *Medical Surveillance Monthly Report*, which provides estimates of the incidence and effects of health-related conditions among service members. We spoke with CAPT Kevin L. Russell, the director of the Armed Forces Health Surveillance Center.

Figure E.1
Study Methods: Step 5



The **Army Study to Assess Risk and Resilience in Servicemembers** collects longitudinal data on suicide, suicide-related behavior, and mental and behavioral health issues in the military. We spoke to Robert Ursano, a principal investigator on the study and a national expert in traumatic stress response. Ursano is a professor of psychiatry and neuroscience and chair of the psychiatry department at the Uniformed Services University of the Health Sciences, as well as the director at the Center for the Study of Traumatic Stress.

Experts Running Large Surveys Assessing Mental Health, Stigma, or Barriers to Care

The **National Survey on Drug Use and Health** provides national, state, and substate estimates of mental disorders in the civilian, noninstitutionalized population, age 12 and older. We spoke with two representatives of the survey. Peter Tice is a statistician by training and currently acts as the Substance Abuse and Mental Health Services Administration project officer for the National Study on Drug Use and Health at the Center for Behavioral Health Statistics and Quality. David Hunter is the project director for the National Study on Drug Use and Health and is currently a program director in the applied social sciences at the Research Triangle Institute. He has nearly 20 years

of experience in data collection management, survey methodology, and data reporting, and oversees the work of approximately 250 professionals and 600 field staff in his role as the National Survey on Drug Use and Health project director.

The **California Health Interview Survey**—one of the nation's largest state health surveys—collects health and health care data from all 58 counties in California via telephone surveys. In addition to health conditions (e.g., asthma, diabetes, heart disease), the survey assesses mental health status, perceived need, access, and utilization of mental health services, mental health stigma, and suicide ideation and attempts. We spoke to Ninez A. Ponce, a principal investigator for the California Health Interview Study and a professor in the University of California, Los Angeles (UCLA), Fielding School of Public Health's Department of Health Policy and Management. She also served as the former associate director of UCLA's Asian American Studies Center (2011–2013). She has expertise in multicultural survey research, social penalties in health and health access, and population-based studies.

The **Experience of Care and Health Outcomes Survey** asks health plan enrollees about their experiences with behavioral health care and services provided by either managed behavioral healthcare organizations or managed care organizations. The survey includes modules for adults and children who have received behavioral health care and services, and is part of the Consumer Assessment of Healthcare Providers and Systems project at the Agency for Healthcare Research and Quality. We spoke to Paul Cleary, the principal investigator for the survey. He also serves as the dean of the Yale School of Public Health and the Anna M.R. Lauder professor of Public Health at the Yale University School of Medicine. He is a national expert on the recognition and management of mental illness in primary care settings.

The **Deployment Life Study** examines how deployment affects the health and well-being of military families over the course of three years by following multiple members of military families (service member, spouse, child) at four-month intervals. The study assesses emotional and behavioral health of family members. We spoke to Terri Tanielian, a principal investigator on the study, as well as co-investigator Anita Chandra. Tanielian is a senior behavioral scientist at the RAND Corporation and has led multiple studies to assess the needs of veterans and their families. She is the former director of RAND's Center for Military Health Policy Research and the author of seminal work on the psychological and emotional effects of deployment to Iraq and Afghanistan. Chandra is director of RAND Justice, Infrastructure, and Environment and a former director of RAND's Behavioral and Policy Sciences Department. She has expertise in the effects of military deployment and mental health stigma.

Experts in Military Mental Health

Thomas Britt is a professor of psychology at the School of Health Research, Clemson University. He has expertise in developing and evaluating mental health help-seeking interventions among military populations and developed a widely used barriers to care

scale. His current research programs investigate how stigma and other barriers to care influence employees in high-stress occupations seeking needed mental health treatment, and the identification of factors that promote resilience among employees in high-stress occupations. Prior to his work at Clemson, he was a research psychologist at the Walter Reed Army Institute of Research.

Alison Cernich is a neuropsychologist. At the time of her interview, she was the deputy director for the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury at the U.S. Department of Defense and the senior liaison from the Department of Veterans Affairs to the Department of Defense on psychological health and traumatic brain injury. In this role, she oversaw strategic planning and major research initiatives for both departments. She also previously served as the director of neuropsychology and director of the Polytrauma Support Clinical Team at the Veterans Affairs Maryland Health System.

Kristie L. Gore is a senior behavioral and social scientist at the RAND Corporation, and an associate director of the Forces and Resources Policy Center in the National Security Research Division. Prior to joining RAND, Gore was the associate director for research at the Department of Defense Deployment Health Clinical Center (DHCC) and the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury; an assistant professor of research in the Department of Psychiatry, Uniformed Services University of the Health Sciences; and scientist in the Center for the Study of Traumatic Stress. From 2006 through 2012, Gore served as the DHCC director of implementation, research, and evaluation, where she managed a health services research portfolio and a team of scientists working to improve post-deployment mental health care for military service members and their families.

Charles Hoge is a national expert on PTSD, mild traumatic brain injury, and other physiological reactions to war, as well as treatment strategies for war-related conditions. From 2002 through 2009, Hoge directed the Walter Reed Army Institute of Research on the psychological and neurological consequences of the Iraq and Afghanistan wars and served as an attending psychiatrist at the Walter Reed Army Medical Center, providing treatment to service members and family members.

Lisa Jaycox is a senior behavioral scientist and clinical psychologist at the RAND Corporation. She has combined clinical and research expertise in the areas of child and adolescent mental health problems, including depression and reactions to violence exposure such as post-traumatic stress disorder. Her recent work has included a focus on the mental health impact of deployment to Iraq and Afghanistan and the systems available to support recovery from sexual assault and prevention of suicide in the military.

Experts in Mental Health Survey Methodology

Sandra Berry is the senior director of RAND's Survey Research Group. She teaches courses on research design and methods at the Pardee RAND Graduate School and

for the Clinical Scholars Program at UCLA. She is the chair of the Human Subjects Protection Committee, which is charged with ensuring ethical treatment of RAND research participants and compliance with regulations governing research with human subjects. She specializes in the evaluation of mental health prevention and early interventions programs in California and rigorous studies of rare or hard-to-study groups, such as HIV patients, adolescents, and gay men and lesbians in the U.S. military.

Julie Brown is the director of the RAND Survey Research Group. She has expertise in the design and conduct of primary data collection and specializes in the development and implementation of patient experience of health care surveys. She co-leads Implementation of the Consumer Assessment of Healthcare Providers and Systems Surveys for the Medicare Shared Savings Program, Physician Quality Reporting System, and other physician-quality programs. She also leads the RAND instrument design team for the Agency for Healthcare Research Quality–funded Consumer Assessment of Healthcare Providers and Systems and is responsible for RAND's efforts to develop and test measures and new data collection approaches.

Audrey Burnam is a senior behavioral scientist at the RAND Corporation. She has been conducting mental health and substance abuse research for more than 30 years, including directing studies to understand the epidemiology of mental health and substance abuse problems and to evaluate delivery of services for individuals with these problems. Relevant research includes an experimental evaluation of integrated mental health and substance abuse services for homeless people with serious mental illness; an evaluation of the parity of mental health and substance abuse benefits as part of the Federal Employees Health Benefits Program; an evaluation of community mental health organizations that integrated primary care and mental health care for adults with severe mental illness under a federal grant program; and an evaluation of California's statewide mental health programs for prevention and early intervention.

Charles Engel is a senior health scientist at the RAND Corporation who studies health system strategies for improving the quality of care and outcomes related to chronic mental and physical health conditions. He has expertise in mental health in primary care, persistent medically unexplained symptoms, postwar syndromes, Gulf War syndrome, PTSD, clinical trial research methods, clinical practice guideline development, clinical program implementation and evaluation, and environmental risk communication. He served on the board of directors of the International Society for Traumatic Stress Studies and is a recipient of the Clare Porter Award for contributions to psychiatry.

Rajeev Ramchand is a senior behavioral scientist at the RAND Corporation. His research focuses on the prevalence, prevention, and treatment of mental health and substance-use disorders in adolescents, service members and veterans, and minority populations. He has specific interest in the epidemiology of suicide and its prevention and was the lead author of *The War Within: Preventing Suicide in the U.S. Military* (2011). He is interested in applying novel approaches in the collection and analysis of

survey data and formerly served as associate director of the RAND Center for Military Health Policy Research. Ramchand is co-leader of RAND's 2014 study on military caregivers, *Hidden Heroes*. He is currently working on studies examining disparities in mental health conditions among minority subgroups in the U.S. military and evaluating the types and quality of services provided on suicide crisis hotlines in California.

David Vogel is a professor in the department of psychology at Iowa State University, where he directs the Communication Studies Program and leads the Self-Stigma Research Collaborative. He has expertise in mental health stigma and its relationship with the experience of mental illness and help-seeking, and developed the Self-Stigma for Seeking Help Scale.

Conducting Phone Interviews with Experts

Experts participated in a 45-minute phone interview with a researcher from RAND. A research assistant took notes during the phone interviews and these notes were used for analysis. The experts were asked to share the following suggestions for DoD:

- **Data collection**: Experts were asked to identify facilitators of a successful mental health-related survey implementation (i.e., getting high-quality data and reaching sampling goals in a timely manner) and challenges to implementing and getting timely data from a mental health-related survey. Probes were used to get experts to think about the mode (e.g., pen, paper, computer), sampling frame, frequency of administration, protections put in place to help encourage honest responding, and confidentiality.
- **System design**: Experts were asked how DoD should use the item banks (e.g., slow monitoring over time or rapid response) and whether DoD's efforts should be linked with other data (e.g., suicide data, medical records data) or integrated with an existing surveillance system/effort (e.g., psychological health, suicide prevention or any other public health surveillance systems). The experts were also asked for their opinions about whether a pilot test is needed, what resource or cost concerns should be considered, and how to make a new system sustainable.
- **Sharing results**: Experts were asked about the kinds of reports and report content that DoD should consider producing, with specific attention to identifying internal DoD and external audiences. Experts also provided opinions on how DoD might get the support needed to facilitate and champion item bank utilization.

Analysis of Interview Notes

Two researchers conducted constant comparative analysis of the interview data (Glaser and Strauss, 1965). First, researchers read through all interview notes and developed a coding scheme to capture cross-cutting recommendations that emerged during interviews. To assess the level of consistency between coders, a sample of three interviews were each coded by the researchers. Intraclass correlation was found to be 0.87, which demonstrated a high degree of reliability between researchers. Themes were organized by each research question and were used to help develop the recommendations in each area for how DoD could consider using the item banks. Note that frequencies and saliencies were not calculated for each recommendation because protocols were tailored for each interview, so specific questions and prompts differed. However, all recommendations were mentioned by at least two of the interviewees.

The final options for utilizing the item banks are presented in detail in Chapter Five of this report.

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This report summarizes the findings of a study to develop an item bank of barriers to mental health care—a repository of survey questions phrased in a nonbiased way about different aspects of mental health treatment and avoidance—for the Department of Defense (DoD); establish the reliability and preliminary validity of the item bank and a short form; and identify options for how DoD can use the item bank to assess and monitor barriers to care.

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