ARROYO CENTER

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis.

This electronic document was made available from www.rand.org as a public service of the RAND Corporation.

Skip all front matter: Jump to Page 1 ▼

Support RAND

Purchase this document

Browse Reports & Bookstore

Make a charitable contribution

For More Information

Visit RAND at www.rand.org

Explore the RAND Arroyo Center

View document details

Strategically Aligned Family Research

Supporting Soldier and Family Quality of Life Research for Policy Decisionmaking

Carra S. Sims • Anny Wong • Sarah H. Bana • John D. Winkler

RAND ARROYO CENTER

Strategically Aligned Family Research

Supporting Soldier and Family Quality of Life Research for Policy Decisionmaking

Carra S. Sims • Anny Wong • Sarah H. Bana • John D. Winkler

Prepared for the United States Army

Approved for public release; distribution unlimited

RAND ARROYO CENTER

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

Preface

The purpose of this study, "Strategically Aligned Family Research," was to improve knowledge management and its application by the Army to address simultaneously soldier and family quality of life needs and achieve the Army's strategic goals in recruiting, retention, and readiness. The Army wants to make better assessments of continuing and changing soldier and family needs for support programs. The Army also wants a process to develop a research agenda to identify quality support services to soldiers and families while making best use of available resources and to improve oversight, management, and accountability.

This report presents final results from the research study, and its findings may interest those involved in providing quality of life services for soldiers and their families by the Army, as well as by the sister services and the Office of the Secretary of Defense. Those who set policies in this area may also be interested.

This project was sponsored by the Assistant Chief of Staff for Installation Management (ACSIM) and conducted within RAND Arroyo Center's Manpower and Training Program. RAND Arroyo Center, part of the RAND Corporation, is a federally funded research and development center sponsored by the United States Army.

The Project Unique Identification Code (PUIC) for the project that produced this document is HQD115806.

For more information on RAND Arroyo Center, contact the Director of Operations (telephone 310-393-0411, extension 6419; fax 310-451-6952; email Marcy_Agmon@rand.org), or visit Arroyo's website at http://www.rand.org/ard.html.

Contents

Figures

Table

Summary

Background

The Army spends more than $2.3 billion annually on soldier and family support or quality of life (QOL) programs that are intended to ease the stress of military life and thus enhance well-being, improve readiness, and sustain recruiting and retention. However, research in support of these programs to determine needs, access, and effectiveness is fragmented, duplicative, and at times lacking in quality or depth of analysis.

The Army leadership wants to develop a research agenda to inform policy and program decisionmaking to align its strategic goals in recruiting, retention, and readiness with the needs of soldiers and families. Such an agenda is expected to inform the Army of the QOL needs of soldiers and families, help gauge the success of programs, improve coordination of research efforts, and determine how best to allocate resources.

Purpose

The Army asked RAND Arroyo Center to help improve its use of research on soldier and family quality of life matters to inform policy and programming decisions. The Army wanted a better assessment of the support programs that soldiers and families need and a research agenda to determine effective support services in light of resource availability and the need for accountability. The Army asked Arroyo to pay particular attention to recruiting, retention, and readiness as strategic outcomes for QOL. The goal of this study is to take a first, high-level look at how QOL research is currently used, to identify gaps in knowledge to suggest areas for new research, and to consider how the Army should think strategically about using research, including its investment in new research. The ultimate objective is an organizational mechanism that strategically aligns research. This first phase can begin to address the Army's objective to make research-informed QOL policy and program decisions and support its research needs. In some ways, the course we undertook for this analysis is similar to the process the Army itself will need to undertake in greater depth and represents the first iteration of a QOL policy and program agenda-setting or roadmapping exercise.

Conclusions and Recommendations

We reviewed of a wide range of literature on QOL, its measurement and linkage to strategic goals, as well as literature on research roadmapping. We also interviewed various policy and program officials to determine how and why they used research. We summarize our findings

from these approaches below and provide references to relevant chapters for more detailed discussion.

The relationship between strategic goals and QOL is not well established (see Chapter Two). The Army's strategic goals for QOL lie in the areas of recruiting, retention, and readiness. Assessing the relationship between QOL and these outcomes is complicated by the lack of precision surrounding just how QOL is defined and measured. Nevertheless, it is possible to discern relationships between QOL and the Army's goals.

With regard to recruiting, the evidence is scarce. The Army offers many benefits, from monetary bonuses to join the military to free or subsidized access to health, recreation, education, housing, relationship counseling, and childcare and youth services. These benefits, which can affect individual views of QOL, are seen by the Army leadership as important to recruiting. Also, how soldiers and their spouses perceive and experience Army life can affect their children's consideration of the Army as a potential future employer.

Research reviewed indicates that how well families adapt to the stresses associated with Army life, in part by using QOL programs and services, can affect retention. For example, the relationship between spousal support and retention is strong, and programs that help spouses cope with the demands of Army life can foster such support.

"Readiness" is a multidimensional concept, with little consensus on its definition. Because readiness is difficult to define, it is difficult to identify what influences it. Nevertheless, some research indicates that the same factors that influence spousal support promote readiness. Other work also shows that satisfied families have higher levels of readiness (however defined).

Beyond the Army's strategic goals, research on other QOL topics indicates relatively consistent findings. For example, junior enlisted members and their households tend to experience more stress and are less able to address problems.

Research currently does not meet the needs of users (see Chapter Three). Typically, policymakers and those who run programs are the users of research. They need research to inform budget decisions, to evaluate programs, and to serve purposes such as identifying the best practices in given areas. They are generally not satisfied with what is available to them. It is also difficult for them to *find out* what research is available that might help them make informed decisions.

Research alignment can help improve decisionmaking (see Chapter Four). Road-mapping is a technique that can help align goals and strategies, and it has been used effectively in a range of venues. The practice would likely benefit the Army as it attempts to match research with its strategic goals. The Army itself is best positioned to construct such a road-map, since it will require substantial work across multiple organizational boundaries to construct one. Additionally, it will take a collaborative effort and a mandate (and new resources) to develop and implement a roadmap that would involve and affect a number of organizations within the Army and across the Department of Defense that have roles and responsibilities for QOL policy and programs.

Conclusions

Our analysis of the data resulted in four overarching conclusions:

Some prerequisites for a rigorous roadmapping exercise are missing. A thorough understanding of the current state of the art and established findings is missing. Also absent is an agreed-upon definition of the key terms relevant to a discussion of QOL for soldiers and families and strategic goals for the Army. Resources are needed to enable major organizations

involved in promoting QOL for soldiers and families in various domains to undertake an active roadmapping process. The resulting research agenda would reflect their concerns and would be designed to achieve their objectives at the program level and support strategic Army vision at the policy level.

Domain-specific research remains central to developing solutions and assessing their effectiveness. Even though QOL requires a big-picture understanding, domain-specific research remains critical. "Domain-specific research" refers to data and analysis covering a defined area, e.g., health, childcare, and spouse employment. This type of research offers the best practices to respond to issues and to measure the effectiveness of programs.

Assessing QOL needs requires a big-picture understanding of stressors within and across multiple domains in life. QOL is a cumulative expression of wellness, and it cuts across multiple domains, from physical and emotional health to wellness in relationships, personal finance, and other areas. The relationship of these domains to one another and the interactions among them are complex; thus, research that improves the big-picture view is especially valuable.

Current needs assessments are not broad enough. Current soldier and family needs assessments do not provide the holistic perspective and rigorous evidence-based research that policy and program officials need to inform planning and budgeting decisions. A needs assessment that tries to understand what support services are needed from the beneficiary's perspective rather than a program-centric one will offer insight into potential redundancies and gaps in what is currently offered by the Army and the Office of the Secretary of Defense (OSD).

Recommendations

Therefore, we offer the following recommendations.

Develop an agreed-upon QOL lexicon, outcomes, and metrics. The Army needs to identify within and across domains the key terms and agree on their meanings. When different terms are used to talk about the same thing and, conversely, the same terms are used but with different meanings, it hinders communication among Army leaders, QOL policy and program officials, and soldiers and families. Similarly, there should be explicit agreement among these stakeholders on the desired outcomes for QOL programs and activities. After there is agreement on the lexicon and desired outcomes, metrics can be developed to measure effectiveness in ways that all can find meaningful and reflective of their goals.

Focus research on individual domains to build the big picture. QOL research should not merely take an amalgamated approach. Domain-specific research is critical to tease out complexities. For a big-picture view, a holistic perspective encompassing multiple domains is essential to appreciate the complexity of relationships between stressors, problems, needs, and effective solutions. Moreover, simultaneous examination of multiple domains enables consideration of coordinated solutions.

Take a comprehensive approach to needs assessment. This approach should be less program-based and focus more on individual soldiers and families. Soldiers do not tend to deal with problems in terms of programs. Soldiers and their families, like their civilian peers, approach life as a set of interrelated issues. Relationship stress, for example, may result from multiple issues including finances, childcare issues, and marital discord. Thus, assessments need to take into account multiple influences and their linkages to determine what the needs are, e.g., for relationship counseling, personal finance education, and the right QOL support services to provide in terms of quality and quantity.

Improve knowledge management to expand research use and identify important areas for new research. A deliberate approach supported by adequate resources will help the Army determine what research is available, how well it answers questions about needs, and what constitutes effective responses in a given domain. A sense for the relative impact of various domains on QOL and even on strategic goals would enable more targeted research to areas where policy programs and services can have the most potential influence.

Make Army QOL research roadmapping a socialization and knowledge-sharing process. The process of building a roadmap is as important as the roadmap itself. The roadmapping process would bring together different viewpoints and organizations relevant to the building, implementation, and evaluation of a research roadmap. For some of these participants, the roadmapping process may be the first time they meet other relevant organizational representatives and learn about their viewpoints. Their interaction over time could foster common understanding of problems, lead to agreement on lexicon, desired outcomes, and metrics for evaluation, and help them to leverage resources for coordinated actions. Other important benefits include increased professional networking and knowledge sharing, which can help engender a community of interest in QOL research and its application to inform policy and programming decisions.

Target research in areas where the Army can make a difference. Some things are beyond what the Army can influence. The Army should focus its research efforts where it can make a difference. This includes interventions in the form of policies, programs, or services to mitigate stressors. It should also take steps to manage QOL expectations among soldiers and families when Army resources are finite and priorities should be given to areas where widespread and unmet needs can negatively affect the Army's strategic interests in recruitment, retention, and readiness.

Acknowledgments

List of Abbreviations

ACSIM   Assistant Chief of Staff for Installation Management
ATC   Applied Technology Council
DHS   Department of Homeland Security
DMDC   Defense Manpower Data Center
DoD   Department of Defense
FMWRC   Family and Morale, Welfare and Recreation Command
HPRR   Health Promotion and Risk Reduction
ICE   Interactive Customer Evaluation
IMCOM   U.S. Army, Installation Management Command
LNS   Leisure Needs Survey
MWR   Morale, Welfare and Recreation
NAS   National Academies of Science
NEHRP   National Earthquake Hazards Reduction Program
NIOSH   National Institute for Occupational Safety and Health
NIST   National Institute of Standards and Technology
NMFA   National Military Family Association
NRC   National Research Council
OSD   Office of the Secretary of Defense
OSD P&R   Office of the Secretary of Defense for Personnel and Readiness
PCS   Permanent Change of Station
QOL   Quality of life
R&D   Research and development
SAF   Surveys of Army Families
SSMP   Sample Survey of Military Personnel
UAS   Unmanned aircraft systems

Introduction

Background

The Army spends more than $2.3 billion annually on soldier and family support or quality of life (QOL) programs intended to mitigate the stress of military life and thus enhance well-being, improve readiness, and sustain recruiting and retention.[1] In the past decade, long and frequent deployments in particular have motivated the Army to expand significantly its commitment to support QOL programs. These QOL programs cover a broad spectrum from health care, relationship counseling, and personal finance training to recreation activities, child and youth services, and spousal employment counseling, to name a few. However, research conducted in support of these programs, e.g., to determine needs, efficiency of access, and efficacy, has been fragmented, duplicative, and at times lacking in quality or depth of analysis. In the face of severe budgetary constraints and the Army's desire to know that the needs of soldiers and families are being met in effective and efficient ways, the Army leadership wants stronger evidence to inform, justify, and shape its provision of QOL programs.

For these reasons, Army leadership wants to develop an agenda of research to inform it of the QOL needs of soldiers and families, provide evidence-based data on the success of support programs, improve the coordination of research efforts, and determine how best to allocate resources to support programs that meet the Army's need to recruit soldiers, retain them, and have a ready fighting force. Since these Army needs were also underscored by our research sponsor, we refer to "recruiting, retention, and readiness" as the Army's strategic goals in this report.

Study Issues

Given these issues, the Army asked RAND to help improve its knowledge management[2] in this area to facilitate its application to deal with soldier and family QOL needs and simultaneously achieve the Army's strategic goals in recruiting, retention, and readiness. The Army wants a better assessment of soldier and family needs for support programs, with particular emphasis on meeting continuing and changing soldier and family needs. It also wants a process to develop a research agenda—or a research roadmap—to lead to effective support services

---

[1] Note that this estimate is informal; a formal estimate is complicated by the fact that the Army has no set definition of what constitutes a "program."

[2] Demarest (1997, p. 379) defines knowledge management as "the systematic underpinning, observation, instrumentation, and optimization of [a firm's] knowledge" exchange systems.

for soldiers and families while making best use of available resources, as well as to improve oversight, management, and accountability. The purpose of this study is first to take a high-level look at how QOL research is currently used, identify possible gaps in knowledge, suggest potential areas for new research, and subsequently consider how the Army should think strategically about using research, including its investment in new research. This first phase can begin to address the Army's objective to make research-informed QOL policy and program decisions and support its research needs. In some ways, the course we undertook for this analysis is similar to the process the Army itself will need to undertake in greater depth and represents the first iteration of a QOL policy and program agenda-setting or roadmapping exercise.

Overview of Research Approach and Organization of the Report

Our approach to this study was driven by the desired final objective: an organizational mechanism that strategically aligns research (in other words, a process to develop a research agenda or roadmap). Figure 1.1 describes our intellectual approach to the problem. The first task was to define QOL: that is, what "QOL" as a domain or subject matter should cover for the purpose of this research. Our definition of QOL and its scope informed our three major research activities: (1) a high-level literature review, (2) interviews with program/policy officials, and (3) a roadmapping literature review. Our analysis led us to conclude that while research roadmapping is one route to knowledge management, the overall problem frame was knowledge management rather than research roadmapping per se. With this in mind, we recommend initial steps to align research strategically. These steps in knowledge management will prepare the Army for a more in-depth and dynamic process in knowledge management, including the possible development and implementation of an Army soldier and family QOL research roadmap. In some ways, the course we undertook for this analysis is similar to the process the Army itself will need to undertake in greater depth and represents the initial iteration of the agenda setting or roadmapping exercise.

As shown in Figure 1.1, this report has five chapters. Chapter Two reports results of our high-level literature review, with emphasis on defining research and QOL and understanding linkages between Army strategic goals and QOL for soldiers and families. Chapter Three reports what we learned from Army and Office of Secretary of Defense (OSD) officials about how they use research in their work, what they use, and challenges to using research to inform decisionmaking. Chapter Four describes lessons learned and insights in research roadmapping and their relevance to developing strategically aligned QOL research for the Army. These three chapters also represent stages in developing a strategically aligned Army QOL research agenda or roadmap. Chapter Five presents our conclusions and recommends initial steps for the Army to consider in its effort to improve knowledge management and apply research to better inform Army policy and programs for soldier and family QOL and to achieve the strategic goals of the Army leadership.

Research Methods

We conducted our three major research activities concurrently. We took what we learned from one activity to inform activities in another.

Figure 1.1
RAND Arroyo Center Approach to and Analysis of Army QOL Soldier and Family Research Knowledge Management
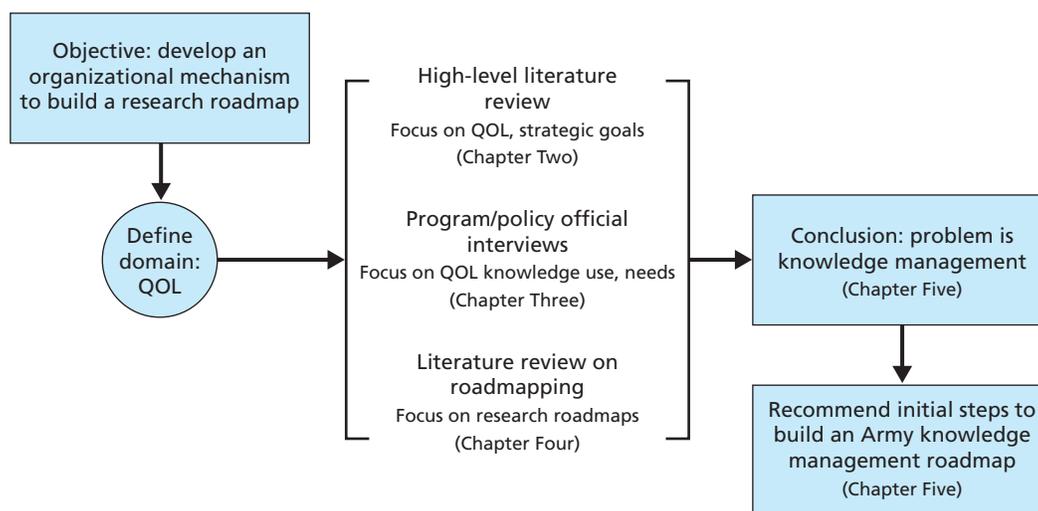
RAND *TR1256-1.1*

High-Level QOL Literature Review

We conducted a high-level review of literature that looks broadly at QOL for soldiers and families and paid particular attention to studies and reviews that attempted to link QOL to the Army strategic goals. We also examined research on QOL for the military and civilian populations. High-level reviews are more common in military-centered literature because they tend to identify and assess a broad catalog of factors affecting QOL. (Civilian-focused research tends to focus on QOL within specific domains, e.g., on marriage, health, childcare, and personal finance.)

As noted, our general topic area is "quality of life." The Army historically has defined this quite broadly, starting with *White Paper 1983: The Army Family*, when Army Chief of Staff General John A. Wickham noted that the Army's QOL program addressed issues of "adequate housing, health care, education, pay, facilities maintenance, safe and healthful working conditions, and essential community morale, welfare, and recreation activities" (U.S. Army, 1983). This same breadth of perspective appears in subsequent writings, such as the 2010 Army Posture Statement and Army Family Covenant, which described a commitment to provide soldiers and their families with a "quality of life commensurate with their service" (U.S. Department of the Army, 2010; and Lorge, 2007) through family programs and services, health care, education, and family member employment initiatives.[3]

In addition, we reviewed research that examined the relationship between QOL factors and the Army's strategic goals of recruiting, retention, and readiness. The definitions for recruiting and retention are self-explanatory, while readiness has varied definitions that center on the individual soldier's and unit's abilities to meet mission requirements (e.g., Burnam et al., 1992; Sadacca and DiFazio, 1991; and Tucker, Sinclair, and Thomas, 2005). These have

---

[3]   http://www.army.mil/article/5641/army-leaders-sign-covenant-with-families offers an overview of the Army Family Covenant.

historically concerned the Army; the Army's concern for soldier and family quality of life has also traditionally been rooted at least in part in concerns pertaining to the Army's strategic goals (see U.S. Army, 1983; U.S. Department of the Army, 2010).

Program/Policy Official Interviews

Since this study focuses on improving the Army's management and application of knowledge about soldier and family QOL, one of our key research activities was to identify major Army and OSD offices that produce or use data and analysis on QOL for soldiers and families. We also included some subject matter experts in academia and nonprofit organizations. The Assistant Chief of Staff for Installation Management (ACSIM), our research sponsor, helped us with the initial identification of appropriate programs and offices, and facilitated introductions to policy and program officials for interviews.

Army and OSD officials we spoke with included those involved in Army community services, childcare, education, suicide prevention and resilience, transition, and other general domains covering both appropriated and nonappropriated funded activities.[4] These officials were mostly senior-level policymakers and program managers. Overall, we considered these interlocutors consumers of soldier and family QOL research and refer to them as "users" throughout this report (compared with soldiers and families who are "beneficiaries" of support services). In some cases, our interaction with an official at one organization led to suggestions for discussions with others in the same or different organizations, including academic experts conducting research-based support for the Army and OSD and experts with nonprofit groups that help the Army provide QOL support services to soldiers and families or are interested in promoting QOL for soldiers and families. Resources permitting, we spoke with as many experts as we could. (Appendix A lists the organizations we visited.)

Broad semistructured protocols guided our discussions: one for Army and OSD officials and a modified protocol for experts in civilian organizations. (These protocols are in Appendixes B and D, respectively.) We used these protocols to answer the following research questions:

1. How do users define QOL or apply it in their work?
2. How do users assess needs of soldiers and families? [We were keen to understand, in particular, needs associated with deployment for soldiers and families who are geographically distanced from the soldier's assigned unit and installation.]
3. How do users use research in their work?
4. What research do users find useful or not useful, and why?
5. What are challenges to their use of research?
6. What do users think will improve strategic development and use of research to promote QOL for soldiers and families?

Also, we developed a selective list of data collection and research efforts by the Army and OSD as well as several research syntheses to facilitate discussions with Army and OSD officials. (Appendix C contains this list.) We viewed research in these discussions in a very broad

---

[4]   In consultation with ACSIM, we decided to exclude housing and health from this study. Although both are relevant to QOL, soldiers and families have not cited housing as a major issue, and health is by and large a matter under the jurisdiction of the Army Medical Command.

sense because a considerable variety of data and analysis is used in these organizations. Examples include Army and non-Army surveys and peer- and non-peer-reviewed studies. Interlocutors were asked to review the list, check those they had used or found useful, add others not listed, and tell us how such data and research serve them.

Discussions typically lasted from 60 to 90 minutes and were treated as confidential. With few exceptions, discussions involved a single participant. We took notes and later analyzed them to identify relevant themes. Some themes were explicit in our protocol, e.g., definition of QOL, which is a question we asked every participant because it is central to this study. Prior to starting the interview process, we had also considered potential uses that these policy and program officials might have for research: we hypothesized it could be used to support a big-picture perspective to predict what service needs and demands might result based on demands on the force and policy changes; that is, it might help these officials foresee and forestall problems. It might also help forecast needs for workforce development, as well as estimate budget requests. It might help officials determine what current beneficiary population needs are and provide evidence that programs are working or need adjustment. Research could also be used to justify current budgets. Finally, research could be undertaken to help program development based on best practices and existing evidence. We coded for these themes as well as other potential uses. Other themes were more implicit in participant responses, e.g., their criteria for assessing availability, quality, and utility of research to inform decisionmaking regarding QOL programs for soldiers and families.

Also, some themes emerged as a consistent topic area across discussions, which we regarded more as spontaneous content than specifically solicited information. Nevertheless, when one topic area was mentioned frequently enough to become a theme or appeared key to the issues, we integrated it into subsequent discussions. For example, numerous users cited difficulties distinguishing between "wants" and "needs" among soldiers and families.

In all, we developed 25 categories to code or classify passages relevant to this study. To develop these categories, we began with an initial set of coding categories, and one researcher applied it to all our discussion notes. Output from this effort informed our refinement of these categories, followed by a second round of coding the passages by the same researcher. Output from this second round was reviewed, and the coding categories were further refined. A second researcher then used these new categories to code a 10 percent subset of discussion notes to determine inter-rater agreement. Overall, analysis indicates that codes for 81 percent of the coded passages were in agreement. This result is quite acceptable considering the exploratory nature of the research and absence of an initial theoretically based coding scheme (Lombard, Snyder-Duch, and Bracken, 2002). Subsequently, the second researcher applied the new categories to all discussion notes. Whenever the two researchers differed in their ratings, they reconciled each discrepancy by consensus.

Literature Review on Roadmapping

Roadmapping can help organizations to understand at a broad strategic level their current position, where they want to be in the future, and the path to that future (Phaal, Farrukh, and Probert, 2007). The Army wants to develop a roadmap for future QOL research to support soldiers and families in an environment of tightening resources. It wants to support programs that best meet the Army's strategic goals while supporting the needs of soldiers and their families or, as the Army puts it, "strategically aligned research."

The body of research on roadmapping, from developing roadmaps to implementing them and evaluating their effectiveness, is considerable. Industry, government, and academia all use some form of roadmapping to assist the implementation of their strategic plans. Research roadmapping is a subset or type of roadmap, and it is this type that we focused on in our literature review. We looked at roadmapping experiences reported by many organizations. Many, like those sponsored by the National Science Foundation, resemble visioning exercises involving experts in a particular field or specialty to articulate areas of research priority and deliberate why and how researchers should tackle them. In most instances, advancement of knowledge is the ultimate goal. On the other end of the spectrum are corporate endeavors that seek to identify research gaps and priorities to meet a particular technological challenge that is identified or anticipated. The ultimate goal is practical and narrowly defined.

What the Army aspires to do falls between these two extremes: it needs broader knowledge across many domains in QOL and to understand the relationships between them, e.g., soldier well-being, spouse well-being, financial health, and marital relations; it also needs application-driven knowledge that will inform policy and programming decisions for QOL activities, e.g., what soldiers and family need, what works, and what can be done better or cheaper. With this in mind, our roadmapping literature review focused on experiences that speak to these concerns of the Army. We also drew insights from experiences that show how varied organizations and interests can work together to develop and implement a single and coherent research roadmap. Implementing roadmaps can also require new resources and new processes, and the involvement of those with interest in the process and its outcomes is critical (Pierce, Kostova, and Dirks, 2001). For this reason, feedback from the Army and OSD officials provided useful insight into potential prerequisites for building an Army QOL research roadmap and potential challenges to its implementation.

Linking Army Strategic Goals and QOL

All military organizations must be able to attract and maintain a ready fighting force, and the Army is no exception. Thus, recruiting, retention, and readiness are the Army's strategic goals in human resource management. To achieve these strategic goals with a volunteer force, the Army has to be an attractive employer in a competitive labor market. Apart from providing financial incentives in the form of pay and bonuses, the Army also offers a comprehensive benefits package including health care, life insurance, and support programs to soldiers and family members. Support services cover a broad range from relationship counseling to childcare, libraries, financial literacy training, education counseling, physical fitness facilities, and recreational activities. All these support services aim at enhancing the quality of life of soldiers and families by helping them deal more effectively with the stress associated with their jobs and life in the military, including deployment, relocations (known formally as "permanent change of station" or PCS in the Army) and new job assignments for soldiers once every few years.

Defining Research and QOL

To examine linkages between QOL and Army strategic goals, we need first to determine what qualifies as research and, within that category, what is included in the domain of QOL, because these two terms are central to delineating the scope of this study. While these terms are broadly used, they can mean different things to different people due to academic orientation or specialty, professional responsibility, and organizational perspective.

Considering the diversity of research users in the Army, we defined both terms in a sufficiently broad manner and grounded them in academic, policy, and legal foundations to make sure we addressed user needs within practical boundaries. Research should not only meet specific quality requirements (it uses the scientific method, it focuses on methodological rigor, and it advances knowledge), but also be useful to users. A definition of QOL, too, must be sufficiently broad but with some specificity on the domains in life that are covered, e.g., marriage, health, and finances. This is because policy and bureaucratic considerations dictate what the Army can do to affect change in research and QOL programs and services. Between these two terms, defining research is somewhat easier as the following discussion demonstrates.

Defining our Context: Research

We define research as "a systematic, rigorous investigation that answers a relevant question or describes a relevant process." We wanted to include the majority of information that the Army would consider helpful to meet its decisionmaking needs, be it Army-specific or not and peer-

reviewed or not. Also, "research" can vary in methodological rigor, and some may not meet the standards upheld by the research community. Nevertheless, we recognize that such data collection and analysis can inform Army decisionmaking. Thus, we chose not to exclude or discriminate such efforts in our definition of research to acknowledge the full spectrum of data and analytical resources used by Army officials in general and by our interlocutors in particular.

For these users who seek to understand a problem and apply data and analysis to practical purposes such as determining a program's resource requirements, the utility of any research goes beyond merely a question of methodological rigor. While methodological rigor is important, a determination of utility should also include the availability and accessibility of the research (e.g., cost, security classification, software to read the data), and the timeliness of the research and its dissemination. These are a broader set of issues with direct implications for users' ability to utilize research.

To inform our definition of research, we turned to several sources for guidance. As Army QOL research will invariably involve use of federal funds, we looked to federal regulations. These generally characterize research as systematic investigation with the goal of greater knowledge or understanding of the topic of study. Department of Defense (DoD) regulations also include guidance on types of funding appropriate for subsets of research, and are frequently based on how far an innovation or finding is from specific applicability. Other regulations include guidance on the presence of some quality indicators such as the reliability and validity of findings. (Interested readers should refer to Appendix E for more details.)

We also looked to the general research literature, which typically stresses application of the scientific method to include observation and description, hypothesis formulation, and hypothesis testing (Eby, Hurst, and Butts, 2009). Research that adheres to the scientific method attempts to describe the relevant factors affecting a process or the process itself. It also seeks to develop and address relevant questions. The effort to impose methodological rigor reflects the extent to which a given research effort provides evidence that supports the conclusions drawn and, ultimately, real-world application of the research. Rigorous research provides data that accurately measure reality and are adequate to the desired purpose; that is to say, all key factors are included and alternative explanations are addressed. Thus, rigorous research that produces valid and reliable conclusions more readily allows generalization and a cumulative knowledge base (Eby, Hurst, and Butts, 2009; Campbell and Stanley, 1963).

This discussion of how research is defined underscores the notion that a definition of research to meet the needs of Army decisionmakers—the users of research—must encompass both quality *and* utility of data and analysis. Thus, our definition includes data collected for descriptive and hypothesis-testing purposes, peer-reviewed or not, but excludes information collected without a clear purpose in mind. Quality without utility would not serve these users. From this foundation, we examine the information and analysis needs of users and determine relevant issues across that spectrum. We address the following: how users define the domain of QOL, the types of research they say they need for their work, what characterizes usefulness in users' eyes, and what characterizes unhelpfulness. In some cases, usefulness overlaps with characteristics of methodological rigor; in other cases, other aspects of utility and accessibility are highlighted. Our end goal is to identify options to improve knowledge management in QOL research, and determine what kind of research agenda would help the Army to better assess the QOL needs of soldiers and families and determine what kind of support services would best meet those needs. Thus, once we had a sense for what constituted research for purposes of our study, we turned to a consideration of the research domain itself: quality of life.

Defining Our General Research Domain: Quality of Life

The common view of QOL in the Army is that it includes anything that can help to reduce or prevent stress and alleviate the difficulties inherent in an Army lifestyle. As noted in Chapter One, the Army's official writings on the topic of QOL cover considerable ground. Our literature review and feedback from Army officials indicate that there is no single official Army definition. "QOL covers everything" is the common refrain. The linkage between stressors and QOL in general and how stressors in any one domain, e.g., personal finance, can affect QOL in another, e.g., marriage, can be very complex and not always direct or explicit. Also, the Army is interested in the *overall* QOL of soldiers and families, even though support programs tend to focus on needs in a single domain, e.g., marriage, childcare, or personal finance.

The Army and OSD officials we met represent the broad spectrum of QOL domains from soldier well-being to child and youth services, education, recreation, suicide prevention, and resilience. When we asked them what their definition of QOL was, they concurred that there is no single standardized official definition for the term in the Army or DoD. QOL, we were told, covers virtually all aspects of a person's life, and preventing or alleviating stress in any domain where it occurs serves to improve a person's QOL. Furthermore, some interlocutors noted that people differ in how they define what QOL means to them. There is no fixed "ideal amount" of QOL for everyone, and QOL perceptions and the effects of stressors on QOL can be cumulative in one or more domains in a person's life. Finally, issues that affect QOL for soldiers and families can occur both inside and outside their military lives. These observations hold important implications for determining what the Army needs to know to provide effective support services to soldiers and families and to do so in an efficient manner.

Our literature review also emphasized research that looks broadly at the military or the Army instead of focusing on a specific domain such as marital relations. Examples include research by the Military Family Research Institute at Purdue University, the Military Family Institute at Marywood University, the Army Family Research Program and its heirs, the Quadrennial Quality of Life Review reports conducted under the auspices of OSD, and research that explicitly attempted to link QOL domains with the Army's strategic goals. We believe these documents provide the syntheses necessary to illustrate the current status of soldier and family QOL and suggest potential knowledge gaps, although these documents and the literature review overall in large part exclude the wealth of research available for other branches of the military itself and within the civilian QOL domain.

First, as noted, our literature search did not yield a cohesive or consistent definition of "quality of life." Indeed, the issue was often dodged by providing exemplar domains or speaking in very general terms (as we do here in this study to enable assessment of our researcher users' experience). At the OSD level, the *2004 Quadrennial Quality of Life Review* described QOL as encompassing numerous domains (OSD, 2004):

1. Family support
2. Counseling services
3. Financial planning
4. Housing
5. Childcare
6. Military spouse employment and career opportunities
7. DoD schools
8. Educational transitions among military children

9.   Commissary and military exchange systems
10. Support for victims of domestic violence
11. Support during the deployment cycle
12. Morale, welfare, and recreation opportunities
13. Tuition assistance for voluntary education
14. Partnerships with the states.

In fact, the report explicitly notes that military usage of the term QOL is usually program- and policy-centric and that it can include anything that can support families. A definition of QOL is also reflected in a three-factor index that operationalizes the metrics to be applied to the domain. The three factors are a measure of perceived soldier and family satisfaction with several of the domains listed above; a measure of "commitment to the military life" based on the organizational commitment framework developed by Allen and Meyer (1996);[1] and a metric using the amount of funds devoted per capita to QOL initiatives. The first two of these factors are fielded as survey items in the Status of Forces Surveys, while the last relies on administrative data.

The *2009 Quadrennial Quality of Life Review* took a similar broad definitional tack. Although it was clear that the Status of Forces Surveys and the Surveys of Active Duty Spouses still contained some of the same items and that the measure of commitment to military life was discussed in the context of its planned validation against actual attrition data, the full three-factor operationalized definition from the *2004 Quadrennial Quality of Life Review* was not explicitly addressed in the more recent work.

Large overviews of the Army domain also avoid defining QOL. The Military Family Research Institute at Purdue University produced an extensive annotated bibliography of various QOL domains including job outcomes as related to communities, employment, marriage, social support, parenting, and well-being (Schwarz et al., 2003). Like the Quadrennial Quality of Life Review reports, this work did not offer an overall definition of QOL or an explicit synthesis of the various domains. McClure (1999) provides an overview of the work done by the Military Family Institute at Marywood University. This overview did not specify a definition of QOL in its comprehensive review of military family literature.

Segal and Harris (1993) documented research findings of the Army Family Research Program in a review titled *What We Know About Army Families.* (*White Paper 1983: The Army Family* originally precipitated this program of research.) Their review also avoided a specific definition of QOL, although some exemplars (such as satisfaction with facets of work and Army family life for the soldier, spousal satisfaction with Army family life, and perceptions of the quality of family programs and services) were provided to narrow the field somewhat. In 2007, the Army produced an update to Segal and Harris' seminal work (Booth et al., 2007). Although this updated literature review defined QOL as a subset of well-being, it persists in a more domain-oriented approach to characterize QOL for soldiers and families while also advancing a subjective well-being orientation for QOL.

This overall lack of a single, definitive, and official definition presents challenges for consideration of the overall domain. A more operationalized and less amorphous perspective enables clarification that interested researchers and policy decisionmakers are indeed discussing

---

[1]   Note that similar measures of commitment are treated as retention intentions in some cases, readiness in some others, and indicators of "quality of life" as in the Quadrennial Quality of Life Review reports.

the same concept or set of interrelated domains. While there is no single, well-defined, official definition for QOL in the Army or the literature, a broad perspective of QOL is appropriate. This is because QOL covers multiple domains of life and can be affected by multiple stressors. Conceptually, stressors do not occur in a vacuum, and they induce similar responses, involving processes of appraisal and coping (Lazarus and Folkman, 1984; Folkman and Moskowitz, 2004). For this reason, we treated definitions of QOL given to us by all our interlocutors as valid. These interlocutors work across a spectrum of domains from childcare to education, relationship counseling, and leisure and recreation. However, the inclusion of multiple domains under the umbrella of QOL means that the definitional specifics and accompanying streams of research within each domain are relevant. The domain-specific approach to defining QOL is, in turn, essential to disentangle the web of relationships across domains that collectively represent or affect QOL, and possibly the achievement of the Army's strategic goals.

Linking QOL to Army Strategic Goals

While QOL is broadly viewed to cover virtually all domains of life from health (physical and mental wellness) to marriage and childcare (relationship and family wellness), leisure (social wellness), and employment (job satisfaction), the motivation to improve QOL among the three groups most directly concerned differs. This is the interaction space of quality of life for the various stakeholders in the Army QOL arena. For the *Army leadership*, QOL is a means to the end of achieving the Army strategic goals of recruiting, retention, and readiness. Their concern is to improve the overall QOL of soldiers and families and gauge how much that contributes to achieving the Army strategic goals. Also, for top Army leaders, their concern about funding for support programs is in the broad sense of all the dollars that the Army spends on them, making little distinction between appropriated and nonappropriated funds.[2] For *policy and program officials* (the "users" of research that we emphasize in this study), QOL is the reason for providing support services to soldiers and families. Their work typically focuses them on soldier and family problems in one domain, e.g., childcare or relationships, because it is how programs are defined or demarcated in the organization (and, incidentally, often within the research literature). Policy and program officials try to gauge specific needs for given programs, decide how best to meet identified needs with the resources available, and typically evaluate effectiveness in terms of meeting soldier and family needs within that domain. Program and policy officials in practice also distinguish between programs supported by appropriated and nonappropriated funds because of direct implications on program planning and budgeting. As the latter covers fee-for-service activities, beneficiary use rates and satisfaction are proxies for "demand" (if not need per se). *Soldiers and families* look to support programs to address needs. They might need information or an advocate, a specific service, or simply a helping hand. Their needs may be one or many within a single domain, such as health. Also, their needs and the appropriate ways to address them can cut across domains. For example, financial problems may be a source of tension in a couple's marital relationship. But to enable them to attend financial

---

[2]   The Army pays the full cost of activities using appropriated funds, as they are deemed essential to soldier readiness, e.g., use of physical fitness facilities and library. In contrast, the Army does not pay the full cost for nonappropriated-funds activities, which are fee-for-service, e.g., yoga classes and recreational outdoor adventures, that are not deemed directly relevant to soldier readiness.

training classes and relationship counseling, the couple may need childcare assistance. Their choice of what support program(s) to use would also be affected by considerations such as ease of access, cost, time and duration, quality of the program and staff, and referral by a trusted source. Distinctions between programs supported by appropriated and nonappropriated funds are generally irrelevant to beneficiaries, other than how they influence cost. Ultimately, soldier and family interest in QOL is personal and preferences are not influenced by the strategic goals of the Army or the policy and programmatic concerns of Army officials. Figure 2.1 reflects these different perspectives.

Our literature review indicates that a growing body of research seeks to understand soldier and family QOL needs, use of support services (both Army and non-Army) and issues soldiers and families encounter in support service access and usage, and how well support services meet their needs. This information increases awareness among the Army leadership and policy and program officials of the needs of soldiers and families. (Input from Army officials in previous RAND research on the Deployment Cycle Support process also indicates that they apply data on soldier and family use of support services and their satisfaction with them as a way to gauge soldier and family QOL needs and the effectiveness of support services; we also heard this from the interlocutors in the current study.) Army officials also use basic demographic data about the force, e.g., number of junior enlisted personnel and number of married soldiers with dependents, in combination with research about the problems common to particular subgroups to gauge potential soldier and family demand for type and volume of support services, as discussed below. However, it is less clear how Army officials use such information to inform decisions on program design, delivery, and budgeting. Finally, research that links QOL directly with Army strategic goals is relatively sparse, as we describe in the sections below.

The Link Between QOL and Recruiting Is Uncertain

Recruiting is the first Army strategic goal, albeit one that was not truly addressed in the QOL literature reviews examined here. Segal and Segal (2006) concluded that an appealing slate of benefits (including much of what falls under the broad QOL rubric) is considered essential for the Army to compete effectively with civilian employers. Sackett and Mavor (2003) reviewed a wealth of research on recruiting, including comparisons of benefits in the civilian and mili-

Figure 2.1
Differences in Motivations for QOL

RAND *TR1256-2.1*

tary sectors, and indicate overall comparability. They note that propensity to enlist is a strong predictor of actual enlistment, but suggest that individual-level research on what affects this propensity remains to be done. Some work focuses on "endo-recruitment" (the recruitment of soldiers from Army families). Work by Leitzel and Zaler (1999) shows that the Army historically draws a high proportion of recruits from military families. Booth et al. (2007) note that because this recruiting pool is traditionally a strong source of soldiers, making the Army a good place for child dependents is important. They describe some research that seems to imply that endo-recruitment is potentially on the wane: when asked how they would respond to a child asking about career advice, soldiers recommended college or vocational school far more frequently than joining the service. However, QOL is not specifically mentioned as a causal factor. Although the literature reviews cited here clearly assume that QOL and the availability of benefits would affect recruiting, they do not provide in-depth research to support this assertion. We currently have little insight into what degree QOL considerations influence recruitment decisions, and the mechanics of this relationship are difficult to track. Therefore, this is an area for additional investigation.

The Link Between QOL and Retention Is Typically Indirect

Retention, the second strategic Army goal, has long been a concern for the Army. The Army must compete with other employers with attractive pay and benefits packages to retain personnel, and the Army must also adjust to changing social expectations of QOL. Today's Army demands a skilled workforce (see, e.g., U.S. Army (2012) on Army training and education budget request). Increased spending on training soldiers also means a greater interest in retaining them. As these changes occurred, so did a demographic shift: today, 56 percent soldiers are married, and many single soldiers marry while on active duty.[3] In other words, QOL takes on a scope beyond self and greater significance in their lives.

Direct linkages between Army programs and services and retention are rare in the literature reviews and research examined here, but indirect linkages mediated by factors such as organizational commitment are common. (However, this may not be as much of a problem in sister service research; one study on the Navy, for example, empirically supports a direct linkage; see Hansen and Wenger, 2002.) The general link between organizational commitment among job incumbents (in this case soldiers) and retention is itself very well established (e.g., Marshall-Mies, Westhuis, and Fafara, 2011; Heffner and Gade, 2003; and Hom and Griffeth, 1995), but these QOL studies suggest that keeping the soldier happy professionally is not enough. The Army must also ensure that dependents—spouses and children—are satisfied with their QOL in the Army to better retain soldiers in service. It is not surprising that Segal and Harris (1993) found that research on QOL for family, prior to the switch to an all-volunteer force, was relatively sparse, in part because Army families were a far smaller part of the Army. Importantly, though, they concluded that spousal support for an Army career has a clear and positive effect on both retention intentions and soldiers' actual retention decisions. Burnam et al. (1992) also found that a spouse's commitment to the Army predicts the soldier's commitment and retention intentions. More recently, Schumm (1999) reported that spouse support, too, was important for retention among reservists (see also Castaneda et al., 2008).

---

[3]   From the Strong Bonds Program website: http://www.strongbonds.org as of May 18, 2012.

Other research reported that perceptions of care for families by the unit leadership can affect the sense of commitment soldiers and families have for the Army as well as their ability to cope with the demands of Army life, including deployments (Bowen and McClure, 1999; and Burke, 1999; see also Huffman, Culbertson, and Castro, 2008), though the effect sizes tend to be modest (Bowen and McClure, 1999). The level of Army funding for support services and other actions for QOL may also affect soldier and family perceptions of care (e.g., Castaneda et al., 2008).

Since deployment is an integral part of being a soldier, researchers have also tried to understand linkages between deployment and retention. While there is no consensus in the research, it offers a more nuanced understanding of the linkages. Also, while deployment is not a QOL domain per se, it is clearly a factor in how well families adapt to Army life. For example, Segal and Harris (1993) indicated that the literature (at that time) showed separation from the spouse for deployment to be detrimental to retention. A summary of more recent literature by Booth et al. (2007) suggested that work-family issues related to deployments were a major reason cited for leaving the Army. This study also noted that while deployments are a continuing stressor, established Army families cope well with this stressor—at least up to a point. Repeated, long, unpredictable deployments can impede Army family adaptation. Hosek (2011), for example, observed a negative relationship between cumulative time (in months) deployed and Army reenlistment (though retention bonuses likely had a mitigating effect on reenlistment rates[4]). Booth et al. (2007) note that Army families can draw upon a variety of social support resources, both formal and informal, and that this social support is key to their successful adaptation to the military way of life. As noted by Orthner (1990) and cited by others (e.g., Segal and Harris, 1993), family adaptation is important because factors such as spouse support for retention affects retention decisions, and Russo (1999) cited evidence that family adaptation to the Army supported both retention and readiness goals. Hosek, Kavanagh, and Miller (2006) concluded that a certain level of deployment actually led to *higher* reenlistment. As may be inferred from the less positive findings above, however, the positive effect of deployments on reenlistment is not always consistent (see also Bell and Schumm, 1999).

The Link Between QOL and Readiness Is Typically Indirect

Readiness, the third goal the Army asked us to consider, is no less important than recruiting or retention; arguably, it is the most important. The Army needs a force ready to achieve its mission in peacetime and in war. Segal and Harris (1993) noted that defining readiness was quite a task in and of itself and highlighted some of the difficulties in reconciling individual and unit definitions of readiness (see also Buddin, 1998). As noted more recently by Tucker, Sinclair, and Thomas (2005), difficulties defining this construct persist (see also McGonigle et al., 2005). This makes statements of findings necessarily equivocal and dependent on the definition of "readiness" used in a particular study.

Nonetheless, there are some illustrative findings using a variety of definitions of readiness. Segal and Harris (1993) noted that the same leader behaviors that influence spousal support (i.e., those that engender perceptions in soldier and spouse that the Army supports them and their families) also promote readiness. Soldier perceptions of this support affect readiness even

---

[4]   Hosek and Martorell (2009) discuss the effects of bonuses in more depth, and note that other benefits and services, including support programs and mental health services, would need to be considered in order to truly tease out the unique effect.

after many individual and family factors (such as gender, years of service, number of dependent children, and spouse support for Army career) are taken into account. Sadacca, McCloy, and DiFazio (1993) found that spousal support did not affect soldier readiness, though it affected retention, while unit support predicted both. Burnam et al. (1992) indicated that emotional well-being is related to some readiness metrics. Burke's (1999) summary of the family readiness literature indicated that regardless of potential vulnerabilities associated with younger and less experienced members of the force, families that are satisfied with the Army way of life have a higher level of readiness. A relatively recent model-driven review of the literature for the military services (McGonigle et al., 2005) hypothesized only mediated effects of varieties of support services and a multidimensional conceptualization of readiness. It argued that inclusion of mediators illuminates the explanatory mechanisms, that is, the reasons why programs and services might be expected to have an effect. In addition, they did note that some evidence suggested that direct effects could be supported empirically as well. Marshall-Mies, Westhuis, and Fafara (2011) (see also Fafara, Marshall-Mies, and Westhuis, 2009) did find such a direct effect of QOL in the Army context (operationalized by Army Morale, Welfare and Recreation program usage) on career issues and unit teamwork/esprit de corps (operationalized by items from the Sample Survey of Military Personnel). Booth et al.'s (2007) review of recent research, including an early version of the study by Fafara, Westhuis, and colleagues, suggests that there is a relationship between Army support programs such as Morale, Welfare and Recreation (MWR) and aspects of readiness. Nevertheless, findings may vary depending on the definition of readiness used, and it was rare to find a direct linkage between program usage and this strategic goal. Thus, there is yet no strong, conclusive evidence of direct linkages between QOL and readiness.

Variations in Individual Needs and Demand for Program Evaluation Also Affect the Context for QOL Research

Although not directly pertinent to the literature on the Army's strategic goals, two other findings appear to be relatively consistent across our high-level review and may be pertinent to our analysis of the research needs of users who have responsibility for developing policy, allocating resources, and evaluating program effectiveness in soldier and family QOL.

The first is that some families have more needs than others, which is pertinent to understanding and predicting beneficiary demand for services and determining how best to target policies and programs as well as to determine allocation of resources in general—all issues potentially of concern to users of research. Aldridge et al. (1997) reported that servicemembers with vulnerability factors (such as being dual-military families or junior enlisted) had more problems responding to a short-notice alert than did servicemembers without comparable vulnerabilities. Dougherty (1999) summarized research, including research conducted as part of the Army Family Research Program, and found that families of junior enlisted personnel have a higher need for support services. She noted that part of the issue was perceptual: even when junior enlisted and senior enlisted spouses used the same services while their soldiers were deployed (the 1993 study she cited examined deployment for Operation Restore Hope), the former perceived the deployment itself as more stressful. Dougherty also indicated that some research findings regarding success in resource utilization and the retention effect of being a

junior enlisted soldier with a family were conflicting. Finally, she noted a need to focus on family adaptation throughout the family life cycle.

Bell and Schumm (1999) discuss some types of families that are more vulnerable to the negative effects of deployment. Booth et al. (2007) indicate that some Army families, such as those of junior enlisted soldiers, have vulnerabilities that make coping with the stressors of life in general and of Army life in particular (permanent change of station moves, deployments) more difficult. Despite the evident assistance needs of some Army families, Bowen and McClure (1999) summarized research suggesting that families did not want a support system that is too "institutional." These consistent findings suggest contextual factors that must be taken into account when examining relationships between programs and services, QOL, and the Army's strategic goals.

The second consistent finding does not affect the relationships between variables of interest per se, but is directly relevant to the nature of research that is perceived as useful by both the research community and research users themselves. This finding is a repeated call for program evaluation. The *2004 Quadrennial Quality of Life Review* noted that program evaluation work was lacking in the military context for QOL initiatives, in part due to the exigencies of the situation that made it difficult to plan for pre- and post-test designs and other good program evaluation initiatives that require groundwork *prior to* the rollout of programs. The Military Family Research Institute at Purdue University offered summaries of the findings across several domains, in particular noting that consideration should be given to the reciprocal relationships between job outcomes and QOL programs in the military before instituting new programs. Again, the need for program evaluation work was also highlighted. Buddin (1998) also described some of the groundwork that would need to be laid for effective determination of effective programs, e.g., defining measurable and appropriately proximal goals. Thus, the need for program evaluation was consistently noted as a gap in the literature and one that should be rectified in order to determine the most appropriate resource allocation: the most efficient and effective use of resources is to devote them to support programs and policies that work to increase QOL or other relevant factors.

Knowledge Management for QOL Is Complex and Nuanced

In short, QOL can affect retention through mechanisms such as spouse commitment to an Army career, family adaptation, and perceptions of leadership support, among others; these same factors also mediate the relationship between QOL and readiness, although there is some evidence of a direct effect as well. The QOL-recruiting literature is less well developed, but there is some evidence of a relationship. Other policy-relevant findings include the vulnerability of some types of Army families (such as those of junior enlisted) and a need for more program evaluation. An important impediment to the development of a truly cumulative knowledge base is the lack of firm agreement on the definition of QOL itself (even to the extent that a specific set of domains are included or excluded), some of the variables important in given domains, and the definition of readiness.

To summarize the implications of these findings for policy and program officials, fiscal challenges in the current environment suggest that reaching agreement on common definitions and taking a more methodical approach to research may be a fruitful avenue to efficiency and conservation of resources, in terms of both conduct of research itself and retaining programs

with a better evidence base. A clear and consistent definition of research and QOL is essential for the Army to advocate policy and defend budgets for activities, including research, to support QOL. Keeping the Army's commitment to soldier and family QOL in mind, policy and program officials are now being asked to demonstrate more rigorously the effect of support programs, including on achievement of the Army's strategic goals when possible, e.g., in the Health Promotion and Risk Reduction (HPRR) portfolio that the Army recently initiated that requires systematic use of metrics and evidence-based reporting of support program performance.

While anecdotal evidence and some research suggest that soldiers who have a positive sense of personal well-being and have fewer concerns about family well-being are more able to focus on their professional responsibilities (that is, readiness), much remains to be done to clarify linkages between QOL in various domains and linkages to the Army strategic goals. Moreover, it is important to highlight that a direct linkage may not be truly tenable given that the relationships among stressors such as deployment, receipt (or not) of program support, and outcomes are all inherently mediated at the individual level, and overlooking that fact may result in overlooking vital aspects of the process. It will result in a lack of clarity about the mechanisms through which QOL affects or does not affect various strategic outcomes and what other contextual factors (such as unit-level support of QOL programs and services) are pertinent to the perceived QOL of soldiers and families at the individual and aggregate levels. It is important to be aware of this when considering development of a research agenda.

Our decision to embrace broad definitions for research and QOL in this study reflects a legitimate concern when dealing with an array of ultimately interrelated issues. Further, it was essential for us to find out how Army policymakers use research and what these users of research needed to know, because the literature does not speak directly to this. We turn to this topic of what Army research users want to know in the next chapter.

Meeting User Needs and Systemic Challenges

This chapter reports the major themes and significant issues commonly cited by Army and OSD officials across multiple domains commonly associated with supporting QOL in the Army. As described in Chapter One, we coded responses from Army and OSD officials to identify areas of agreement in their needs for research and issues they perceive or have experienced in using research. We also coded our discussions with non-DoD interlocutors, but they are not the primary focus of much of this analysis. In total, we spoke with personnel from 26 different organizational units, both military (19) and nonmilitary (7), and coded a total of 429 passages from discussions with them. Out of these 429 passages, 350 belonged to 19 sets of discussion notes involving 27 Army and OSD officials. As stated in Chapter One, although our sample population is small, the Army and OSD officials we spoke with are widely regarded as knowledgeable experts and important decisionmakers in soldier and family QOL policy. Therefore, while consensus among seven or ten of these officials may, on the surface, seem like a miniscule segment of the entire scope of the Army bureaucracy, few others are similarly positioned to affect soldier and family QOL policy and the provision of support programs to these populations. Note that this chapter focuses primarily on reporting the users' views of research, rather than a thorough critique of their views. Their perspectives and opinions are ultimately essential to improving knowledge management (i.e., use of research) in the Army. Our examination of roadmapping as a knowledge management tool, and subsequent conclusions and recommendations, incorporate our findings and analysis regarding this perspective.

QOL Is Broadly Defined as Stress Related

Our discussions with interlocutors, both within DoD and outside of it, typically began by asking for their definition of QOL. There was no noticeable difference in the definitions provided by interlocutors who are in the military compared with those who belong to private-sector organizations. Their responses correspond to two major themes in the literature: (1) QOL lies in multiple domains, and (2) the provision of services and programs in any of the included domains was invariably intended to increase satisfaction with Army life, alleviate general stress, and compensate for some of the challenges (e.g., deployments, permanent change of station moves) inherent to Army life. Some interlocutors also observed that QOL is tied to an individual's characteristics (e.g., some people are more resilient than others regardless of the problems they face), circumstances (e.g., having a parent, spouse, or friend for emotional support or children with special health and educational needs), and perceptions of consequences and means to cope with a given stressor.

Policymakers Draw on Multiple Sources for Information, but Most Army and DoD Research Is Not Positively Viewed

Most interlocutors have some familiarity with several items in the list of sample research we used to facilitate our discussions with them. They include survey data from the Sample Survey of Military Personnel (SSMP) and Surveys of Army Families (SAF), as well as results of Interactive Customer Evaluation (ICE), a mechanism for collecting customer feedback on services at installations. However, surprisingly few admitted to actually having used these sources or found them helpful to their work. They reported that the data or analyses available were not particularly relevant to their information and analysis needs. For example, with one exception, none of the interlocutors who know ICE said they consider it a useful information source. The common perception among these interlocutors is that ICE does not provide high-quality data when typically feedback comes from those who are very satisfied or dissatisfied with the service they received. Neither was the Leisure Needs Survey (LNS) well regarded. Interlocutors complained that results of the LNS are too high-level to be useful to support installation-level planning and budgeting decisionmaking. They also complained that it took too long for LNS results to become available, so that "information was antiquated by the time we got it."

Another source of information cited is Army and DoD administrative data, e.g., the number of single, enlisted soldiers, to gauge potential demand for particular services, as well as data collected regularly by support programs on user profiles, usage rates, feedback, etc. Data and analytical reports on QOL for soldiers and families are also used, as well as those on comparable populations outside the Army. For example, information on trends in specific sports and pastimes for young men is considered useful given that young men are such a big part of the Army population.

However, there appear to be few systematic ways for interlocutors to learn about the existence of such studies or where to access them. Interlocutors remarked that they think more research is available than they know about individually. One interlocutor cited topic-oriented electronic mailing lists and social media networks shared by a community of practitioners as ways to share information such as announcements of research studies and their results. Interlocutors also reported personal and professional contacts as sources and conduits for information. Finally, a compelling source of information for our interlocutors was anecdotal evidence observed or stories about stressors and means to cope, either told directly to policy officials by soldiers and families or heard from colleagues. Such cumulative, though not exactly systematic, knowledge and experience may explain why interlocutors say they "rely on common sense" to inform their decisionmaking.

What Users Need from Research

Data from our first few discussions with Army and OSD officials launched our iterative process to construct a conceptual framework to identify critical knowledge gaps. Specifically, what do these Army research users with responsibility for support programs need from research, for what purpose, and what research might meet that need? The data we collected suggest the following answers.

Inform Planning and Budgeting

First, users want to know the needs of soldiers and families to inform plans and budgets for support programs. Many needs are well established, e.g., soldiers and families need childcare services, as do many working parents whether they are in the military or not. Yet what is not always clear is what motivates soldiers and families to choose military childcare programs over other options. Knowing this is important for the Army to directly or indirectly provide the right type and amount of childcare support programs. For example, if private-sector providers can offer comparable quality of childcare service at equal or lower cost and with the same or higher satisfaction rates, helping soldiers to obtain private-sector service may make more sense than providing a military childcare option.

Identify Needs

Users emphasized consistently that they desire more information and analysis on the QOL needs of soldiers and families. We discerned three types of needs-related topics in particular.

Emerging Needs. Users want to know about emerging needs of soldiers and families. For example, one interlocutor told us that female soldier divorce rates are rising, and the Army wants to know what these soldiers need to better manage their relationships. The response may involve use of existing programs or require development of new ones, each with funding, staffing, marketing, and administrative ramifications for the Army. Demographic and administrative data for the Army population, e.g., the number of soldiers who are married or with children and the age profile of the soldiers and their dependents, are being used to identify emerging needs. However, a drawback is that such data, as one interlocutor puts it, suggest the "potential customer base" rather than truly assessing needs. Research, e.g., surveys and analysis, can speak to what these beneficiaries perceive as needs (e.g., childcare, after-school programs for teenagers, or assistance to identify resources in the civilian communities they live in) and factors that drive their selection and use of support programs (e.g., price, proximity to home, convenient hours, quality of staff and facility).

Subgroup Needs. Since soldiers and families are also members of the larger American society, research on civilian populations in the United States and elsewhere should generally apply to understanding soldier and family needs. Nevertheless, there are subgroups of particular concern to policy officials. Interlocutors reported wanting more research on the needs of teenage dependents (e.g., how they are affected by relocations and deployment). Another subgroup of interest consists of soldiers and families stationed overseas who may look more to the Army and OSD support programs to meet their needs because local resources in host countries are either unavailable or inaccessible to them.

Distinguish Needs from Wants. Last but not least in considering the needs of soldiers and families, interlocutors underscored their desire to distinguish needs from wants. Such research can directly affect their policy recommendations, planning, and budgeting for support programs. Although the Army has a responsibility to meet soldier and family QOL needs, the Army cannot feasibly meet all wants. Yet distinguishing needs from wants has never been easy: what is a need for some may be a want for others. Further, what makes something a need rather than a want may change because of different life circumstances, e.g., when a soldier is assigned to a unit that is at an installation far from his extended family and support community, on- or off-installation childcare service may change from a want to a need.

Evaluate Effectiveness of Support Programs

Users want research that supports program evaluation. Beyond knowing what the needs are and responding to them with support programs, Army and OSD officials need to know that what is provided *works*. In other words, they need research to tell them whether programs are effective in helping to improve, as one interlocutor put it, "health and life outcomes" for soldiers and families. The data we collected suggest that effectiveness of Army support programs is frequently evaluated in terms of customer satisfaction (or even customer perceptions of a support program). However, customer satisfaction does not necessarily mean that a need is met (or that the problem is solved). For example, those who use a program (e.g., childcare) may be satisfied with what is offered given options available, but they may still need more hours of childcare. Satisfaction ratings are also typically asked of *program users*, potentially missing those who have tried the program, found it unsatisfactory, and gone elsewhere, as well as those who have gone elsewhere to begin with. Utilization data, we were told, are also used to measure effectiveness. However, as interlocutors correctly point out, utilization does not equal effectiveness. As one interlocutor put it, "no one knows what works." This is a sentiment echoed by other interlocutors. To determine effectiveness in terms of the desired outcome of a support program, it is essential to have the right measures and data. For example, a financial literacy program could be considered effective if soldiers who have completed the program score higher in indicators of financial health, e.g., no unmanageable debts, than their peers on average or those who did not complete the program. Other desired outcomes that could be measured as metrics of effectiveness would include financial knowledge improvement, that is, on a test of financial knowledge, beneficiaries do better after completing the financial literacy program than they did prior to the program. Ultimately, if the goal of any such program is an Army strategic goal, research requires information on program participation information and subsequent information on retention and readiness (presumably with information about relevant mediating processes, such as information on the financial basis for clearance revocation, financial success during the course of an Army career, etc.). Interlocutors told us that they know of little or no research on how to effectively address stressors or how support programs are linked to retention decisions.

Other Uses of Research

Several other uses for research were mentioned, but less frequently. One is to know the empirically supported best practices in a given field to guide program design and implement state-of-the-art interventions in a given domain. Another is to obtain a larger perspective on the interrelationships between variables in the target population to gauge potential problems down the line and the potential second-order effects of a policy decision, including linkages to the Army strategic goals of recruiting, retention, and readiness. Users also called for more research on stress and needs associated with reintegration from deployment. Interlocutors said that ten years of deployment have spurred research on the effects of deployment on soldiers and families, but far less is known about the QOL issues related to reintegration. Finally, users want research to assess organizational manpower requirements, workforce structure, and staff development. For example, research would help Army officials to more effectively advocate for hiring and training childcare specialists if they know that more soldiers have children or expect to have children in the next 12 to 24 months *and* plan to use military childcare services.

How Use Matches Stated Needs

How well did what our interlocutors said match the rough framework narrative we describe above? Table 3.1 shows the frequency of topic mentions in the 19 discussions with our Army and OSD research users.

Since interlocutors can address the same topic multiple times in a discussion, a look at our data by the number of coded comments received within a given discussion provides another perspective. Most remarkably, the use of research to ascertain needs was mentioned multiple times in 11 of the 16 discussions that addressed the issue, and program evaluation was mentioned multiple times in 7 out of 13 discussions that addressed the issue. These two uses of research were by far the most frequently mentioned in terms of both the number of discussions that raised them and the number of times within a given discussion they were mentioned by our research users.

Beyond learning about what the uses of research are for our interlocutors, their input highlighted a significant issue: the research available did not meet their information and analysis needs. Many interlocutors noted that research questions, e.g., in surveys, were not really designed to obtain information about outcomes they were interested in. In some cases, this was because measurement of a given outcome is difficult (for example, when the desired outcome is *prevention* of problems); in other cases, a hypothesized causal chain was absent within the data collection. Also, when resources for research emphasize program design and implementation, the resulting analysis and data collection do not meet their information and analysis needs for subsequent program impact evaluation.

Another research gap we heard, one more in line with ascertaining population needs, was an inability to assess who could benefit from a given program but was not using it and why. Though this did not come up in the majority of discussions with users, some users underscored a need for sophisticated synthesis and analysis rather than simple reporting of cross-tabulated data to answer the question of the "ghost customers" who should be using Army support programs but are not doing so because of some reason that is unclear to the Army. Knowing overall patterns of relationships between QOL and other factors would also help estimate what one user called the "tipping point" for when serious harm at an individual level has a negative impact overall for the Army, and predict longer-term outcomes from immediate program usage and satisfaction.

Table 3.1
Frequency of Topics in Discussions with Army and OSD Research Users

Topic	Percent of Discussions with Users Mentioning Topic
Needs of soldiers and families	84
Program evaluation	68
Justifying budgets and dealing with political considerations	37
Seeking best practices	26
Workforce development	21
Big picture applications	16

Characteristics of Helpful and Unhelpful Research

Our discussions with interlocutors tried to determine from their perspective the characteristics of good (helpful) and poor (unhelpful) research. Aside from quality of research in the conventional sense of evidence-based analysis, we tried to understand other reasons that can make research helpful (or unhelpful) to these policymakers. These reasons include access to the research data and findings, capacity to use the research, and timeliness of the research to inform decisionmaking (e.g., the time it takes for data and analysis to become available).

Again, we looked at the responses we received by the number of discussions with users where a topic was raised and, in some cases, the number of times a specific theme was mentioned within a given discussion. In some cases, the discussion with users dealt with specific topics that appeared multiple times across multiple discussions with users; at other times, more idiosyncratic topics were mentioned in a single discussion. Included in the category of generally poor research, studies deemed not useful because of poor sampling design or response rate (e.g., they were not representative) were mentioned in 5 of 19 discussions with users. A related issue mentioned in 6 of 19 discussions with users was bias, when most respondents to a survey are likely those who had an extreme response to a service or program. Interlocutors frequently cited ICE assessment as an example of this. Another much-cited issue was the mismatch between questions and the thrust of data collection with the information and analysis needs of our research users. This was raised in 8 of the 19 discussions with users. Interlocutors attributed this to survey research questions that target the entire soldier and family population rather than only those at a particular garrison or that focus on childcare services in general rather than a specific childcare program. Seven of the 19 interlocutors noted that existing research does not address the question of effectiveness, that is, whether a given program or service actually produces the desired outcome.

Also, the vast majority (16 of our 19 discussions with Army and OSD research users) touched on some general characteristic of poor research. Issues specific to access, e.g., inability to identify existing research (knowing where to look or who to ask to find out) or to obtain identified research (having subscriptions to data providers) were mentioned in nine of the discussions. In addition, five of the discussions cited the lack of time, resources, and capacity to conduct or utilize research. Finally, timeliness of research to meet their information and analysis needs was mentioned in five of the discussions.

Another matter raised in our discussions with Army and OSD research users is the problem of getting research done at all. One issue mentioned was getting research approved by institutional review boards and human subjects protection committees. Although necessary, these processes can add months of time, additional paperwork requirements, and stress to tight decision timelines and budgets. In some cases, a more holistic approach to the research and a more complete representation of the situation can involve surveying members of the general population. This requires approval from the White House Office of Management and Budget, which can again take many months and an enormous amount of additional work. In short, the prospect of many time-consuming requirements (considering competing work demands) and potential delays for approval can stop or block research completely.

Several users, particularly those familiar with garrison-level needs, stressed that rapid completion of research and dissemination of results are essential to inform decisionmaking at that level to sustain service delivery. Complicating this is the ever-present challenge of time and capacity to use research. Short of staff, overburdened with responsibilities, and subject to tight decision timelines, officials are compelled to tap into what they most readily have available to

inform a decision. Any research that requires more time than they can spare or capacity than they have on hand to dissect and digest simply is not used. When good data and evidence-based analysis are not available and accessible, decisions are then informed by other sources, including past experience, intuition, or a commander's order.

Focusing strictly on methodological characteristics of good research, eleven of the discussions with Army and OSD research users addressed this topic. Those users who are more research savvy said good research is marked by the presence of adequate sampling strategies, proportionate weighting, and modeling. Also, ten of the discussions cited research results presentation as a hallmark of good and useful research. Presentation of results in a concise format, suitable for an audience that does not have a lot of time to assimilate information and needs it quickly accessible (one user employed the term "sound bites") was mentioned in four discussions. Six discussions yielded suggestions to improve presentation of research. Overall, they suggested designing presentation of research results in ways that will better enable use by policy and program officials. This applies equally to a written report, a brief, and other forms of presentation. One interlocutor proposed specifically more general presentations for mixed audiences and distinct modules for those from the same organization or sharing the same interests. As a related issue, interlocutors in three discussions said researchers should bear in mind the need to develop distinct research products for their audiences as part of their research design and data collection.

Six users emphasized that research should make clear recommendations. Also, the topic of having information well couched in context was addressed in seven discussions with our Army and OSD research users. In their view, having a mountain of data without context is simply not useful. Six users also said they want research that can speak to the effectiveness and cost of programs. Although not as common, some users said they want research that would suggest a sense for overall patterns and tipping points, and a way to forecast future needs and problems. Likewise, some users want research that can inform them of soldier and family QOL trends over time.

Seven of our interlocutors raised the thorny problem of distinguishing between needs and wants of soldiers and families. They mentioned services, originally intended to serve one purpose, e.g., education, that are now also seen to provide entertainment and stress relief. Others stressed that whether a service or program actually addresses the problem is difficult to determine, and some spoke of the need to look for a behavioral tipping point to separate needs from wants. However, none of our users offered solutions to this problem.

All interlocutors asserted that they assess the needs of soldiers and families. In some cases, this assessment was purely at the anecdotal level; in others, systematic data collection served their purpose. Many indicated that they also tracked satisfaction or program usage (or both) or used demographics to forecast the needed program resources. However, discussion of the outcome or effect of a given program or service suggests that something is lacking in this overall assessment process. Although very few explicitly asked for research that explicates a big-picture overview of a stress-QOL-outcome process and soldier and family QOL needs, their responses to our questions demonstrate that such research would clearly help to meet their underlying information and analysis needs.

Knowledge Management in the QOL Domain Requires More Army Capacity

Other issues raised defy clear categorization or were infrequently mentioned but possibly important in that collectively they speak to broader issues regarding knowledge management.

Thus, these issues speak to the difficulties users face in integrating existing research and considering future research needs and hence are relevant for consideration in terms of appropriate incorporation of existing and future research. For example, several users indicated that they were not really sure what research is definitive, that is, there was not a consistent knowledge of "known knowns." This is significant, given that an overall sense of the multiple domains of QOL could help users consider how programs might interact with one another in the lives of beneficiaries. It is a recognized weakness that soldier and family beneficiaries are not directed to the totality of resources that could benefit them in their specific situation, and they are not given "warm handoffs" to these programs and services.

Some users discussing the perceived lack of a knowledge base indicated that the current climate of frequent deployments puts findings from past research into doubt. There is no question that the situation in the Army has changed since the Army Family Research Program was initiated in the late 1980s and concluded in the early 1990s. However, even then some research spoke to deployments, general vulnerabilities to stressors, and mechanisms that might be used to achieve the Army strategic goals in recruitment, retention, and readiness. Thus, the question is not whether these relationships still exist, but how they are affected in a new context of high-frequency and lengthy deployments. Interestingly, responses from many interlocutors indicated that they do not believe research of an earlier period speaks to the current context. It is not clear how they acquired this view and how this bias affects Army management and use of research in QOL. Put another way: Is research completed 10–20 years ago still valid and relevant today? Certainly, depending on what the information and analysis needs are, some research has to address matters that pertain to the current soldier and family population exclusively (e.g., measuring satisfaction with and effectiveness of a new telephone hotline to answer their support-needs queries). At the same time, research that was well designed and executed to understand general human conditions (e.g., how physical separations can negatively affect spousal and parent-child relationships) can withstand the test of time to provide meaningful insight. It was telling that when we pursued this point with our interlocutors, they agreed that past research had merit. In fact, previous research with relevant variables in large systematic samples of Army soldiers and families can provide a strong foundation for current and future research.

Finally, few interlocutors initially acknowledged the utility of civilian research. However, because the Army population is a subset of the general U.S. population, it is potentially relevant to the military context, as our interlocutors agreed when this point was pursued. Moreover, in some cases they acknowledge the relevance of general society in the services they provide. For example, the widespread popularity of social networking has prompted many garrisons to expand wireless Internet access in common areas to encourage broader social interaction. Indeed, given the sizable body of research on the general U.S. population, it would be remiss for the Army not to tap into it. Interlocutors, too, concurred that this is true but again underscored their lack of time and capacity to use civilian research and adapt it to answer questions about the military population that they serve. This inability to transfer the findings appears to be a common weakness in research usage among Army users. While speaking more generally on relevant issues rather than to specific stressors such as deployments, civilian work is more likely to include quality factors such as longitudinal designs in which the effects of multiple variables are controlled.

The lack of time and capacity to adapt research can be extrapolated to the issue of sister service research as well. Although research may be applicable, our Army interlocutors were not

as familiar with it and suggested that the Defense Manpower Data Center (DMDC) research, for example, was less relevant because it was so broad. Though DMDC surveys do go to a large number of cross-service personnel and do not often speak directly to specific programs, we argue (and our interlocutors in fact expressed similar sentiments) that a general approach to QOL issues is warranted. Moreover, the sophisticated sampling and broad design of such work can convey other advantages, including a less program-centric approach to various QOL domains. Finally, as noted in our literature review in Chapter Two, some of the sister services have had some success in disentangling the relationship between QOL factors and strategic goals more clearly than has the Army-centric work.

Potential Priority Areas for Research

We asked both our military and nonmilitary interlocutors what questions remained to be answered by research to better inform Army decisionmaking on QOL support for soldiers and families. We received a number of suggestions in 12 out of our total 26 discussions with all military and nonmilitary personnel, with some interlocutors offering more suggestions than others. The research topics described here do not suggest any hierarchy of priority or sequence, though generally speaking they may be considered the "known unknowns."

Linking QOL to Army Strategic Goals

Interlocutors raised the issue of establishing links to any of the Army strategic goals of recruiting, retention, and readiness. Our research users are fully aware that the senior Army leadership cares deeply about achieving these strategic goals and are keen to understand linkages between them and QOL. There is, however, relatively little robust research available to answer this question. Building a body of research to do so will be challenging, and potentially require considerable time and resources. Moreover, such research must be deliberate and coherent in approach, and mindful of the complexities in disentangling individual-level outcomes from outcomes of success in recruiting, retention, and readiness for the Army. One suggestion we received was to use exit interviews to learn from soldiers whether QOL problems were part of their reason for separating from the Army.

Measuring Effectiveness in a Broad Manner

Users spoke of measuring effectiveness more generally rather than strictly in terms of any of the Army strategic goals as outcomes. They raised the issue of the need for the Army to use longitudinal research to determine the outcomes of various facets of the military experience. There were also calls for evaluations of the full package of benefits and for tracking understudied populations, e.g., military children, to more effectively ascertain how military life affects them. In connection to this, the need for prevention research (also inherently longitudinal) was underscored, particularly as it pertains to resilience.

Issues Affecting Distributed Populations

The need for more research on issues affecting distributed populations—geographically dispersed soldiers and families—was also called to our attention. They include soldiers and families who belong to the Army Reserve and the National Guard, as well as active component soldiers and families who live far outside an installation. Because they are geographically dispersed, outreach to inform them of Army support programs and enabling their access to Army

support programs, which are typically installation-based, may require different strategies and approaches.

Big-Picture Research

Woven throughout discussions with interlocutors is the need for big-picture research to clarify linkages between Army life experiences and QOL. Such research would help the Army to formulate the right questions and variables for longitudinal process-oriented research that may clarify linkages between QOL and Army strategic goals. It would also elucidate the larger context in the lives of soldiers and families to shed light on the complex linkages between QOL problems, stress factors behind them, and policy and program responses that may be helpful.

Assessing Soldier and Family Needs

Last but not least, interlocutors strongly suggested a need for an assessment of soldier and family needs, which now appears to rely heavily on anecdotal evidence (Miller et al., 2011). Specifically, an in-depth assessment of problems perceived by soldiers and families and what they identify as potential sources for assistance would be helpful. From there, investigations of perceived stressors and coping mechanisms could explore why some soldiers and families choose Army support services while others choose to use other sources for support services or even to use no support service at all. Moreover, exploration of the relationships in a general model of stress and coping could elucidate some of the inherently longitudinal overarching questions that interlocutors want answered, as well as the complex webs of cause and effect, and advance understanding of the nexus between QOL and Army strategic goals.

Some of the answers described above speak to themes we heard throughout our interviews, and also to gaps noted in the literature review: in particular, program evaluation research is an outstanding need for users. This type of work is also inherently longitudinal, requiring advance planning to execute a "before" and "after" research design to help clarify whether the program itself had an impact. Many of the QOL outcomes desired are not immediate, and an appropriate examination of programs requires the passage of time to produce their desired effect.

In summary, users value research and want more research that is high in quality, accessible, and useful to inform their work. In terms of research topics, users want information and analysis that will inform them about the needs of soldiers and families and the effectiveness of programs. In light of the budget challenges faced by the Army and the rest of the federal government, the pressure intensifies to spend every dollar wisely for both programs and supporting research.

In addition, users need research that speaks to them in a clear way and is timely, since they frequently have limited time and capacity to digest a large volume of research while juggling heavy workloads and striving to meet tight decision timelines. Indeed, the lack of time and capacity among users to access and use research is a fundamental barrier to promoting greater use of research in decisionmaking to inform policy, budgets, and program evaluation. Thus, research that is clear in stating the context for its findings and/or recommendations, appropriately designed in its presentation of results to speak to policymakers, and timely in its dissemination appears to be urgently needed though in short supply.

Also, these users would benefit from assistance to identify research relevant to understanding QOL for soldiers and families (current and past; military- and civilian-focused). Doing so would provide a more comprehensive review of the relevant literature to help identify knowledge gaps and direct resources for new research that will add value to the cumulative

knowledge base on QOL for soldiers and families. We next turn to a consideration of how to better manage research knowledge for Army soldier and family QOL. Specifically, we examine one tool that can help achieve better knowledge management: research roadmapping.

Aligning Research to Improve Decisionmaking

Successful organizations adapt to change. They have clear goals, develop strategies, and systematically mobilize resources in pursuit of those goals. In this regard, effective use of research—qualitative and quantitative data and analysis—is essential to inform decisionmaking. Research helps define goals and inform strategy development, implementation plans, and subsequent performance-monitoring efforts.

Roadmapping is one approach to help align goals and strategy.[1] More specifically, it is "a disciplined process for identifying the activities and schedules necessary to manage technical (and other) risks and uncertainties associated with solving complex problems" (Ma, Liu, and Nakamori, 2006). The Army wants to use roadmapping to better align Army QOL research to improve decisionmaking regarding provision of support programs and to achieve its strategic goals in recruiting, retention, and readiness.

This chapter begins with a brief description of what roadmapping is generally and what research roadmaps are specifically. Next, it highlights lessons learned in the roadmapping experiences examined and insights relevant to the Army. Finally, it discusses how the Army might use the lessons learned and insights to develop and implement its own research roadmap.

Roadmapping and Research Roadmaps

Roadmapping is one method that can be used to develop a high-level project plan with details on actions, durations, and checkpoints to assess progress and success in addressing a complex problem. A roadmap can help to break the complex problem down into significant subproblems and help with planning research, defining milestones, and determining routes to take. Thus, while a strategy spells out the vision, goals, opportunities and initiatives, a roadmap provides the details on how to move forward, who will be involved, and how long it will take. In short, roadmaps provide "a time-ordered, prioritized and auditable agenda for action" (Fernandes, Ralph, and Voukalis, 2010).[2]

Roadmaps can be developed through different means, such as collaboration of a small team of experts, a workshop that involves a wider array of participants from across government and industry, or computer-based analysis of large databases for citations, patents and licenses,

---

[1] "Roadmap" as a concept of a guide to go from one place to another or to get from one state to another has been in use for a long time. Roadmaps or roadmapping as a strategic planning and management tool has a more recent history. Research attributes Motorola as the first to pioneer this concept and apply it with success (McClees, 1987).

[2] Roadmaps are distinct from foresight. Roadmaps focus on finding the best way to realize the expected future, while foresight focuses on what the future will be like.

or sales to identify trends in research, technology, and products. These approaches can also be combined: organizational leaders define a vision and goals (i.e., set a strategy upon which to base a roadmap), internal and external experts speak to the strategy and technical issues to meet them, managers and staff counsel practical considerations in roadmap development and implementation, with all these deliberations supported by computer-based analysis. Together, the participants in the roadmapping exercise elucidate what is known or unknown about the problem, as well as uncertainties, to flesh out scenarios and determine priorities and options for action (including research) to respond to the critical need. In short, roadmapping is a participatory and interactive process. It allows participants to share views, expertise, and experiences. It also encourages people to argue, socialize, and build consensus. This consensus-building process is one function of a roadmap.

Another function of the roadmap is communication. A roadmap can help to "visualize the hierarchy of scenarios" and show a plan and its timeline for action to audiences both internal and external to the organization. By laying out who will be involved and their roles and responsibilities, the timeline, milestones, and pathways, the roadmap manager can more easily oversee, coordinate, and assess the effort's progress and success (Ma, Liu, and Nakamori, 2006).

All roadmaps basically address three questions: (1) Where are we now? (2) Where do we want to go? (3) How can we get there? (Ma, Liu, and Nakamori, 2006). Technology roadmaps are one of the most common applications of the process. Their purpose is to explore the future direction of technology development. For example, an automotive manufacturing firm can use roadmapping to address a critical need to inform technology selection, development, and implementation to build a more fuel-efficient vehicle. Customer demand, environmental regulations, and energy prices may be drivers for this critical need. In roadmapping, the firm would not preselect a preferred technology, e.g., high-efficiency diesel engines, new lightweight composite materials for body and engine parts, or more aerodynamic body design. Rather, roadmapping allows the firm to explore a broad spectrum of technology alternatives to meet its goal, and examine different pathways for an informed choice (Sloman, 2007).

Other roadmaps are more conceptual in nature. These roadmaps articulate major concepts rather than provide prescriptive guidance on programmatic decisions. The intent is to explain how a plan of action will be implemented. These roadmaps function as strategic communication tools. One example is the Army Transformation Roadmap (U.S. Army, 2004), which describes "the execution of the Army transformation strategy in the context of evolving security challenges, continuing high demand for operational forces, and lessons learned from recent operations." This roadmap "refines the Army's transformation strategy and details Army actions to identify and build required capabilities to enhance execution of joint operations by the current force while developing the capabilities essential to provide dominant land-power capabilities to the future Joint Force." Another example (also from the Army) is the *U.S. Army Roadmap for Unmanned Aircraft Systems 2010–2023* (U.S. Army, UAS Center of Excellence, undated). The roadmap outlines how the U.S. Army will develop, organize, and employ unmanned aircraft systems (UAS) from 2010 to 2035 across the full spectrum of military operations. The intent is to establish a "broad glide path" for future UAS capability development and use.

Another common type of roadmap is the research roadmap, the type most pertinent to this study. Research roadmaps help to identify scenarios and priorities to advance new areas of research (e.g., in neuroscience), link research with industry (e.g., for technology transfer and

development), and to promote interdisciplinary research (e.g., between biological and social science research). A research roadmap can help an organization to identify its knowledge gaps and determine priorities for action to achieve strategic goals of the organization. Like other kinds of roadmaps, research roadmaps can be developed using any one or a combination of the approaches described earlier.

Lessons Learned and Insights for Army QOL Research Roadmapping

Since the Army is interested in research roadmapping, we narrowed our review primarily to research roadmaps. Many sources describe research roadmaps in technology development, perhaps the most typical application of research roadmapping. These descriptive essays provide a sense of the structure, processes, and resources involved in research roadmapping, and frequently speak to how the research roadmap will be implemented. This includes management of the processes, metrics used to measure progress and success, and questions or actions to consider whether modification of the research roadmap or its implementation plan is required.

In addition to general best practices from the larger body of literature on research roadmapping (see, for example, Sloman, 2007; Garcia and Bray, 1997; Mankins, 2002), we looked for exemplars according to the kind of research problem they address (e.g., pushing frontiers of knowledge or responding to a policy need), the kinds of organizations involved (e.g., federal government, industry, and academic society), and the amount of details about the roadmap and the roadmapping process that is available. We found a few research roadmapping experiences particularly helpful because of the details available about what inspired them and the process involved in developing them. They are: the Department of Homeland Security's Roadmap for Cybersecurity Research, the Applied Technology Council's National Earthquake Hazards Reduction Program (NEHRP) Research and Development (R&D) Roadmap, Arup's Roadmap 2010, the European Council's Aging Research Roadmap, and the National Institute for Occupational Safety and Health (NIOSH) Roadmap for Research on Asbestos Fibers and Other Elongated Mineral Particles. (See Appendix F for short descriptions of these research roadmaps.) Also, like the Army's objective to improve soldier and family QOL and meet Army strategic goals, each of these research roadmaps represents a response to a complex problem that requires multidisciplinary research, multi-domain understanding of the problem, or involvement of multiple organizations to implement the research roadmap.

As stated earlier, all roadmaps should clearly articulate (1) where we are now, (2) where we want to go, and (3) how we plan to get there. To expand on these three points, roadmapping typically involves several stages (Bennett, n.d.; Sloman, 2007):

1. Formulate the issue: involves an agreement on what the problem is and articulation of challenges, prospects, threats, and opportunities to respond to it.
2. Goals planning: involves articulation of the ends to be achieved.
3. Means planning: involves a generation and examination of policies and proposals for action.
4. Resource planning: involves articulation of inputs (money, personnel, facilities, services, etc.) necessary to execute the roadmap.

5. Design of implementation and control: involves articulation of who is to do what, when, where, and how. Also articulated are a timeline with milestones and metrics to monitor progress.

Overall, data collected for this research suggests that the Army has some way to go toward launching a rigorous research roadmapping process. While some requirements are present, some critical elements are missing. For example, the Army has no clear awareness of its baseline of knowledge, e.g., what is known about QOL for soldiers and families, what programs work, or what soldiers and families need ("where we are"). We discuss some specific applications of these lessons learned and insights below. We believe progress in one or more of these actions, even if incremental and not resulting in a full-scale roadmap, would still benefit the Army in its effort to improve evidence-based decisionmaking on QOL policy and programs.

Explicitly Articulate and Agree on Key Terms, Their Definitions, and Objectives of a Research Roadmap

Roadmapping begins with participants having a common understanding of the key terms involved, their definitions, and the objectives of the research roadmap (Bromfield and Arney, 2008). Different groups or individuals may use the same words but with different meanings and connotations. Agreement on the key terms, especially when the terms may appear deceivingly simple (like the term "QOL"), is all the more important to ensure that everyone involved is actually talking about the same things. As we underscored in Chapters Two and Three, the Army has no single definition for QOL. Also, QOL can be interpreted broadly to encompass virtually all aspects of life, but what QOL means for every soldier and family can differ. This variability holds important implications for Army efforts to gauge soldier and family QOL needs and to respond to those needs with the right support programs in terms of content, access (time schedule, frequency, pricing if applicable, location), and outreach strategy. Since proponents may work at cross-purposes in their definition and measures for QOL, it is also otherwise uncertain that the research they sponsor will advance the knowledge base to increase comprehensive understanding of issues, problems, and response options.

There should also be explicit agreement on the objectives of a research roadmap to avoid potential confusion and conflict. Just as participants in roadmapping may use the same words but talk about different things, an explicit agreement on the objectives of a research roadmap would ensure commitment of resources from all parties involved. Agreement on objectives goes beyond commitment of resources. All participants involved must also agree on metrics for outcome measurement. What gets measured gets done. Choosing the wrong or conflicting metrics will hinder the collective effort to improve evidence-based policy and program decisionmaking to increase QOL for soldiers and families and achieve the Army's strategic goals.

In each of the research roadmaps examined, significant time and effort were invested to engage participants to reach explicit agreement on key terms and objectives. Facilitated discussions actively engaged participants in the roadmapping process to speak out, and multiple iterations were sometimes needed to reach agreement.

Our observation of the absence of a clear and explicit agreement on definitions for research and quality of life in the Army in general and within the QOL community in particular strongly argues for an effort to address this as the first critical step toward developing a strategically aligned QOL research roadmap. Clarifying definitions of key terms would illuminate the scope for research. It would also illuminate what organizations should be involved,

the nature of their involvement, and relationships among them. For example, some organizations are research enablers (they control research budgets, conduct research, or have authority to approve research proposals), while others are research users whose data and analysis needs must be accounted for when setting research agendas and setting timelines for research. There will be varied perspectives toward and interests in QOL research roadmapping, and making them explicit can help avoid potential friction and promote agreement and cooperation. Other than Army policy and program officials, researchers in QOL domains can also contribute to definitional discussions.

In addition, this first step will benefit significantly from sustained championship by senior Army leaders. Exhortations to improve the situation must be accompanied by resources for high-level summits, for example, to highlight Army goals in aligning QOL research and developing a research roadmap, as well as to pay for personnel and logistics to sustain participation in processes to define key terms, roadmap objectives, and subsequent roadmap development and implementation.

Have a Systematic Approach to Develop a High-Quality Research Roadmap

Developing a high-quality research roadmap requires a systematic approach to produce an evidence-based plan for action. Objectives must be associated with a timeline and milestones. Having a hierarchy and sequence for tasks helps to delineate priorities and give a sense of order to the actions that will be taken. Moreover, clear tasks make explicit assignment of responsibility for their achievement much easier. Also, having provisions on how to inject new knowledge into the research roadmap and make necessary adjustments will help a roadmap stay current and relevant. Finally, the roadmap must have appropriate metrics and measures to monitor progress in implementation and evaluate whether the objectives are achieved. In short, a high-quality research roadmap is rigorous in content and implementation, and it stays relevant to policy and practice through defined mechanisms.

For example, Arup's roadmap is a strategic research plan that articulates objectives, down to a technical level, to facilitate development of a corporate research strategy. Arup used a series of questions to guide discussions in developing its research roadmap:

- What is the plan of action to achieve the stated goals?
- What are the specific objectives and when do they need to be achieved?
- How will other efforts and initiatives be leveraged, including industry and international initiatives?
- How will the roadmap be adjusted in light of new knowledge?
- How much time is required for the plan to become effective?

Lessons learned and insights from the roadmapping experiences examined strongly suggest designating one organization or consortium to lead the research roadmapping effort. A clear mandate, along with support and resources from senior Army leaders, can help bring together Army QOL research and Army QOL policy and programs communities that our research indicates are loosely linked at present. Indeed, designating the right organization(s) and providing them with adequate resources and an explicit mandate to do so will significantly affect success in roadmapping and roadmap implementation.

As described above, the first critical task will be to determine and define key terms and objectives for the research roadmap. Subsequently, organizations participating have to deter-

mine a process, timeline, and metrics to gauge progress. The resulting research roadmap should reflect the Army's strategic vision and goals, as well as the objectives and interests of participating organizations. It should also include descriptions of the processes to execute the research roadmap, milestones/targets in a timeline, and metrics to measure progress and success. To keep the roadmap current, there should be a process to incorporate new data and analysis and insert important questions into each iteration. In short, the research roadmap must be explicit in being a mechanism for knowledge management.

Having a designated facilitator and organizer for these discussions will help to drive the process in roadmapping. Such discussions will likely undergo multiple iterations prior to participants agreeing to a "finished" roadmap. Outside experts, as nonpartisan moderators, can facilitate these discussions and shepherd participants through stages in research roadmapping. As our discussions with Army officials indicate, they are simply too overwhelmed to take on any more responsibility. Outside experts can also offer expertise in research roadmapping, which may be lacking in the Army organizations.

Articulate What Is Known, What Needs to Be Known, and Why Development of a Credible Research Agenda Is Needed

After reaching agreement on the key terms and objectives of the research roadmap and having a systematic framework to build and implement it, participants must flesh out the framework for research. In the Arup research roadmap, for example, participants in roadmapping must explicitly articulate the drivers for research, their implications for near-, mid-, and long-term research agendas, and how they tie to short- and long-term business objectives. In the case of a strategically aligned QOL research roadmap, a systematic and comprehensive current review of the body of research available on QOL for soldiers and families, as well as for similar populations and issues in the sister services and the civilian sector, is an essential step to determine where critical knowledge gaps lie and what makes them "critical"—and then explore options to address them. The key questions for participants in roadmapping can be summarized in the following:

- What are the key challenges or problems the research roadmap aims to address?
- What does the current research tell us? What does current research not tell us?
- What are the critical gaps in knowledge? What makes them critical?
- What areas, if any, need new research from the ground up?

Note that some of these are partially addressed already in the current study, but may require further development to result in a fully formed research roadmap.

When implementation of a research roadmap will involve multiple organizations and multiple funding sources, it is all the more important to be clear and make a credible, persuasive argument for the proposed research agenda. For example, the Department of Homeland Security (DHS) has no plan to self-implement the cybersecurity research roadmap it developed. Its intent is for other U.S. government agencies, industry, and foundations to use its articulation of 11 hard problem areas in the roadmap to guide their funding in cybersecurity research. The European Community's aging research roadmap also lays out a set of research priorities but leaves it to other entities to fund and conduct research. Making a clear case of what is known, what needs to be known, and why is, therefore, essential to selling these research roadmaps to researchers, funders, and policymakers, and ultimately achieving objec-

tives in these research roadmaps. This is especially relevant when roadmap implementation will involve multiple organizations, each with its own mission objectives, resources, interests, and independence.

Given this, engaging interested *and* relevant organizations, including senior Army leadership, to discuss their viewpoints on QOL and its linkage to the Army's strategic goals, their research needs and expectations of the research roadmap will help produce a viable research agenda. Discussions to align research with Army strategic goals can benefit from input from the Army Recruiting Command, the Army Human Resources Command, and the Army Forces Command, which are, respectively, lead organizations for the Army's strategic goals in recruiting, retention, and readiness. Complementing their viewpoints is input from QOL researchers from inside and outside the Army community and soldier and family representatives and unit and garrison commanders. The former can offer expertise on QOL data, analysis, and approaches to investigation. The latter can offer insights into experiences of beneficiary populations. Collectively, they will help inform roadmapping participants of near- and long-term priorities in the research agenda, define specific research questions, call out underutilized research, mitigate redundancy and waste, and assess the feasibility and reasonableness of research plans. Thus, processes to clarify what is known, determine what needs to be known, and articulate reasons for the research agenda are central to a robust research roadmap.

Participation and Buy-In Are Essential to Roadmap Development and Implementation

A "good" research roadmap is not simply the product of a group of smart people sitting together. Having a research roadmap is just the first step. The real key is implementation, whether by the organization(s) that developed it or by all who are interested in the subject and share the same vision. A research roadmap that is excellent in design but has no buy-in from relevant parties is in effect nothing more than a glossy motivational poster, and in practice serves no one. Thus, it is critical to involve participation and encourage buy-in from those with significant interests in the problem that the research roadmap aims to address.

A research agenda should be developed in a consultative manner with the involvement of knowledgeable experts from within and outside the creating organization. Users and beneficiaries of research should also be involved. For the Army, this means policy officials and program managers who are the users of research, as well as the soldiers and families who are beneficiaries of support programs. After all, it is the concern for their well-being that is motivating the Army to explore quality of life needs and potential remedies. A participatory process in roadmapping helps to build a sense of ownership in the final product. It reduces the likelihood of silent resistance or outright opposition to the research roadmap, and promotes access to resources in personnel, funds, data, etc. that are essential to implementation of the roadmap.

In Arup's case, roadmapping was initiated by means of a workshop process to consider the strategic issues facing its business and to produce a strategic plan in a manner that had buy-in across the organization. Through a series of workshops over a span of many months, the roadmap was validated across Arup to secure a high level of buy-in. In the case of the European Community aging research roadmap, experts from many disciplines were brought together in multiple work sessions over the course of several months to share what is known about the aging process and important considerations and priorities for improving QOL for the elderly and their caregivers. To promote adoption of the roadmap, research priorities were determined by the widest possible consensus among key stakeholders spanning the spectrum from policymakers to the elderly, product producers, and retailers. In the case of the Depart-

ment of Homeland Security roadmap for cybersecurity research, the whole initial roadmapping process took 15 months to complete. The resulting roadmap was then officially launched and implemented throughout the organization. Subject matter experts participated in regional multiday workshops in person as well as in virtual workshops to discuss each of the 11 topics. All participants were also engaged in a structured and iterative process to review and revise their opinions in each topic area and for the whole research roadmap.

For the Army, our suggestion to involve relevant and interested organizations in roadmapping—from defining key terms, objectives, and metrics to identifying critical research issues and processes, milestones, and a timeline to execute the research roadmap—contributes toward success in implementing the roadmap. Roadmapping research, as well as research on organizational change, consistently underscores that a sense of ownership and buy-in is key for successful implementation of change (Beer and Eisenstat, 1996; Fernandez and Rainey, 2006; Pierce, Kostova, Dirks, 2001). Without it, key players in the process have no reason to invest their energy and resources to develop or implement a research roadmap. The lead organization(s) and facilitator(s) must be skilled at motivating participants to engage in the roadmapping process. They must be skilled at inspiring participants to cooperate, build trust, and find agreement even when views may differ.

Beyond developing and implementing a research roadmap, the roadmapping experience can foster a more collaborative community of interest in QOL research and its application. Army organizations should go beyond doing research within the confines of bureaucratic stovepipes and be more interactive with each other and sensitive to the research needs of other potential users. Through the roadmapping experience, members in this community of interest may become more willing and able to work with each other, leverage resources, share knowledge, and jointly develop more comprehensive understandings of soldier and family QOL needs and appropriate Army responses to them, and be more deliberate in soliciting input from the users and disseminating research to them. This side benefit of roadmapping can have far-reaching and long-term positive consequences for the Army.

With all this said, we believe the Army should not seek a ready-made QOL research roadmap. The Army can, and should, take the small but important steps toward developing a strategically aligned QOL research roadmap. External entities can help facilitate the development process, but participation and buy-in from various Army organizations with interest in soldier and family QOL is critical. While the mandate for a research roadmap comes from the top Army leadership, building and implementing one requires bottom-up involvement from many Army organizations to truly meet the Army's strategic goals, inform Army decisionmaking, and ultimately benefit soldiers and families.

Conclusions and Recommendations

The Army wants policy and programming decisions associated with the provision of support programs to soldiers and families to be informed by information and analysis. It is a means to the end of providing the right support services to soldiers and families and to ensure that Army resources are wisely spent. These twin objectives are important motivations for this study. In addition, the Army wants to know how soldier and family QOL is linked to its strategic goals in recruiting, retention, and readiness, and it wants a strategically aligned Army QOL research roadmap to guide an agenda of research to accomplish these objectives and strategic goals.

Answers to Our Initial Questions

Through discussions with key QOL policy and program officials in the Army and OSD, as well as input from experts outside the Army and review of previous research, we found answers to the six major user-related research questions shown in Chapter One. We also highlight information obtained from both sources (interview, literature review) as applicable below.

How do users define QOL or apply it in their work? Overall, the absence of a single clearly articulated and official definition for QOL can impede determination of what research is needed to answer the Army's questions about soldier and family QOL. The general view is that QOL is broad in scope, encompassing virtually every aspect of a person's life, and that a multitude of stress factors can affect QOL. Although general agreement is present, clear articulation is lacking not only among users but also within the literature. Assessing the relationship between QOL and strategic outcomes is thus complicated by a lack of precision surrounding the definition and measurement of QOL from both user and literature perspectives, though evidence is available suggesting a nuanced approach is necessary.

How do research users assess the needs of soldiers and families? Perceptions of QOL and satisfaction with QOL are ultimately at the individual level. This can complicate assessments of overall QOL needs of soldiers and families, as well as evaluation of the effectiveness of support programs, by research users, who typically approach the problem from a program-based perspective.

How do users use research, what research do they find useful, and what are the challenges to using research? We also found that Army and OSD policy officials desire to use research to inform their work. The downside, though, is that relatively little research that the Army produces, and of which users were aware, was deemed useful or high quality. More fundamentally, Army and OSD research users cited the lack of time and capacity to identify, acquire, and digest research as important hindrances to their use of research. Feedback from

these research users underscored that not only should research be of high quality in the academic sense, it must also be available, accessible, and clearly presented to influence decisionmaking. When policy and program officials do not know what relevant research is available or have no time or means to digest it, they are compelled to rely on their own knowledge, intuition, past experience, anecdotal evidence, or a commander's intuition to inform their decisionmaking. Although literature that relates to the questions our policy users face is available, it often highlights the complexities of the QOL domain rather than providing easy or program-specific answers.

What do users think will improve strategic development and use of research to promote QOL for soldiers and families? The Army and OSD research users also have a fairly clear notion of the research they need for their work. They called for more research that assesses the QOL needs of soldiers and families and evaluates the effectiveness of support programs to meet soldier and family QOL needs—two areas the current literature also suggests are lacking. These research users also want research to help them to distinguish needs from wants, gauge emerging QOL needs, and assess the needs of subgroups such as teenagers and soldiers and families overseas.

Again, having good research is necessary but not sufficient. We heard from research users that they want faster dissemination of research results to better support their decision timelines, have results placed more clearly in context, and be more accessible in their presentation. Roadmapping is one technique that we investigated to help align research better overall with the needs of these research users.

We found that the practice of roadmapping would likely benefit the Army as it attempts to match research with its strategic goals. The Army itself is best positioned to construct such a roadmap, in an iterative process, because it would require substantial work across multiple organizational boundaries and a collaborative effort to construct one that achieves buy-in. It would also require a mandate and accompanying resources for execution.

With that said, our conclusions and recommendations speak to the larger questions of how the Army can improve management and application of QOL research, and increase understanding of QOL linkages to the Army's strategic goals of recruiting, retention, and readiness. The order of our conclusions does not imply any sequence or hierarchy of importance, although some of our recommendations serve best as foundations for others. Each is important on its own merit, and we intended them collectively to inform Army thinking toward achieving the twin objectives of this study: to have evidence-based decisionmaking and to know that resources are wisely spent to deliver effective support programs to soldiers and families.

What We Conclude

Analysis of the data collected led us to four major conclusions. They focus on the important issues in using research to develop a research agenda or roadmap to improve the Army's ability to gauge the QOL needs of soldiers and families, to know it is meeting those needs, and to understand if and how QOL links to the Army's strategic goals.

Some Prerequisites for a Rigorous Roadmapping Exercise Are Missing

As was stated in the preceding chapter, developing a *formal* research roadmap has certain requirements, and they are largely missing in the Army. Setting the research agenda begins

with an explicit agreement on definitions of the key terms. There are no such agreements at present in this discussion on QOL for soldiers and families and strategic goals for the Army. While organizations involved in QOL may use the same terms, it is not clear they are talking about the same things. A process that proactively engages them to define the key terms explicitly is a first step in developing a research agenda. Also, a thorough understanding of the current state of the art and established findings is essential to determining what should be in the research agenda relative to Army objectives. At present, there is a wealth of information, but an explicit articulation of the cumulative knowledge available is absent.

Also, major organizations with policy, program, or research responsibility for QOL should be actively involved in roadmapping, and one organization or consortium has to provide leadership. Engaging these organizations to define the key terms, establish the knowledge base, and articulate research objectives will increase their sense of ownership in the resulting research roadmap. Even the most well-thought-out research roadmap will achieve nothing without the major QOL organizations supporting it, integrating it into their plans, and committing resources to its implementation. An Army organization (or consortium) should lead the roadmapping process with a clear mandate and resources from senior Army leadership. At present, there is no such mandate and resource provision.

We do not have a definitive suggestion regarding oversight and responsibility for improvement of Army QOL knowledge management, although ultimately some champion is necessary for any such endeavor. The idea of a single Army clearinghouse for all QOL research appealed to some of our interlocutors, while others worried that it would create new bureaucratic hurdles and fiefdoms in an already complex and burdensome organizational environment. It is beyond the scope of this study to determine who should lead this knowledge management effort, whether a *new* organization is needed, and whether processes should occur inside or outside the Army to effectively and efficiently improve the use of research by Army officials. That said, ideally we believe *senior* Army leadership should initiate and support a high-level discussion among the major Army offices involved in producing and using QOL research to determine a strategy and approach to more systematically manage knowledge for research users to develop and implement policies and programs to meet soldier and family QOL needs and achieve the Army's strategic goals in recruiting, retention, and readiness.

Domain-Specific Research Remains Central to Developing Solutions and Assessing Their Effectiveness

Domain-specific research remains central to developing solutions and assessing their effectiveness, even for interconnected problems, as relationships within domains themselves are complex and specific domain-relevant information is pertinent. For example, even if lack of childcare is a source of marital friction, parents want childcare solutions that offer a safe and positive environment to their children, and the latter is what childcare research and best practices tend to focus on (rather than marital friction). That domain-specific knowledge in childcare is necessary because it helps Army officials to develop solutions and evaluate outcomes. Similarly, financial problems may undermine the sense of personal well-being and stress relationships. A soldier has to learn to avoid debt and invest for the future through interventions such as personal financial training to address the core problem itself, though other services such as relationship counseling may ultimately be needed. Domain-specific research offers in-depth understanding of the complexities of problems within a domain and offers best practices to respond to issues and measure the effectiveness of mitigators. This domain-specific research,

e.g., in personal well-being, financial well-being, and marital and social relations, is critical to help the Army to understand existing *and emerging* problems for soldiers and families in each domain and across them.

Also, domain-specific knowledge and its integrative use will inform the Army's development of solutions (in the form of support programs and services) and evaluate their effectiveness (how well they help beneficiaries solve their problems). In the Army's current effort to develop a Health Promotion and Risk Reduction portfolio for evaluation, for example, domain-specific research is used in an integrative fashion for holistic understanding of the complex mix of soldier and family QOL issues and to assess whether existing support programs are sufficient, appropriate, and effective in helping soldiers and families meet their needs. We believe this is the correct approach. Participating organizations can also use insights and experience from this effort to benefit the definition of key terms and establish the knowledge base as the Army works to develop a QOL research roadmap.

Assessing QOL Needs Requires a Big-Picture Understanding of Stressors Within and Across Multiple Domains in Life

QOL is a cumulative or holistic expression of wellness in one's life. It encompasses wellness within and across multiple domains: physical and psychological health; emotional and social connectedness to family, friends, and community; freedom from financial and legal worries; a comfortable, safe, and secure place of residence; etc. Stress in any one domain can spill over and negatively affect wellness in others. For example, financial debts can negatively affect the ability to pay for comfortable, safe, and secure housing and thus foment marital conflict. Soldiers and families can also experience stress associated with frequent moves, deployments, and other demands peculiar to military life.

These complex linkages across domains (as illustrated in Figure 5.1) and how deployment and other features of military life interact with these domains and affect QOL underscore the need for a big-picture understanding of their effect on QOL for soldiers and families. This means understanding not just how life domains are linked or interact with each other, but also how they do so in the context of life in the military.

Recent RAND research highlighted these complex linkages across domains and explicated implications for the Army's provision of support services (see, e.g., Miller et al., 2011). Although QOL at the individual level can differ significantly due to variations in individual circumstances and coping resources, in the aggregate for more than 500,000 soldiers and family members there will be demand for information, advocacy, assistance, training, and other forms of support services. Thus, research that improves a big-picture perspective of the stressors and their relative urgency for soldiers and families within and across life domains can help the Army more comprehensively gauge associated soldier and family QOL needs and strategically plan and implement prevention and mitigation responses.

Current Needs Assessments Are Not Broad Enough

The desire for more research to assess soldier and family needs came through loud and clear in the feedback from the policy and program officials we met. Current needs assessments that utilize such proxy indicators as soldier and family demographics data, customer satisfaction ratings, and data from surveys that are not specifically designed (or are poorly designed) to assess soldier and family QOL needs do not provide the rigorous evidence-based research that policy and program officials must have to inform planning and budgeting decisions. A needs

**Figure 5.1
A Sense of Wellness Across Multiple Interconnected Domains in Life Affects QOL**
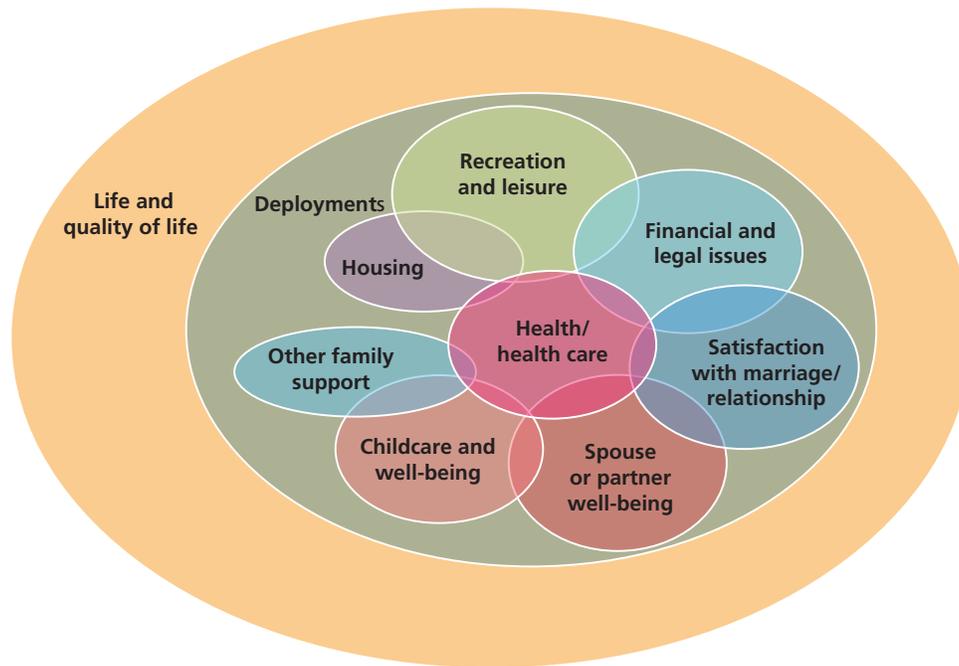
RAND *TR1256-5.1*

assessment that tries to understand what support services are needed from the beneficiary's perspective will offer insight into potential redundancies and gaps in what is currently offered by the Army and OSD. Whether it is information, instruction, advocacy, assistance, or other forms of support services, knowing the QOL needs of soldiers and families is an essential first step toward helping them individually and collectively mitigate stress and attain a high level of well-being in their lives.

Research such as that by Miller et al. (2011) offers one approach for a broad assessment of soldier and family QOL needs. By separating problems from needs, it calls attention to domains and types of actions to respond to needs that go beyond the confines of existing support program boundaries. It provides nine broad problem categories (soldier well-being, spouse well-being, child well-being, health care, marriage, legal and financial matters, work-life balance, household management, and military rules and culture) and seeks to understand *from the soldier and family perspective* what is needed to sustain or restore wellness in each. Needs, too, are placed in broad categories rather than in terms of existing support programs and services. They include general information, specific information, an advocate, advice or education, professional counseling, emotional or social support, and activities. Using a conceptual construct like this in a survey of soldiers and families could help elucidate the kinds of assistance soldiers and families need in each problem category that can be aligned with existing support programs and services to determine redundancies, gaps, and priorities for action.

In the end, any effort to improve the use of research by Army organizations with responsibility for QOL policy and programs will add rigor to decisionmaking. Proceeding in an unorganized fashion, however, would remain far from optimal with respect to knowledge cre-

ation, sharing, and application across the Army for overall effectiveness and efficiency of QOL support programs.

What We Recommend

We offer six recommendations for consideration by the Army. Our recommendations focus on actions that we believe are essential for the Army to improve the use of research to meet its objective of supporting soldier and family QOL needs. The first two are foundations upon which subsequent steps rest.

We expect that long-term and lasting improvements, including the creation and implementation of a strategically aligned Army QOL research roadmap, will require deliberate planning, time, resources, and sustained commitment from the senior Army leadership and relevant QOL organizations. Developing and implementing a research roadmap will be an iterative process. New data, analysis, policy priorities, and other factors might demand adjustments to the research roadmap. A good research roadmap is never static. Whether as a result of modifying core assumptions behind it or adjusting timelines and metrics, a roadmap is a living entity that has to be responsive to changes in the environment it exists in to help its users get to where they want to go. Just as a driver may need a roadmap to identify alternative paths when unexpected barriers occur (vehicle traffic, road blocks, inclement weather) or risk delay or never reaching the destination, so too should policymakers use a research roadmap to find alternative routes to their goal.

While our analysis suggests that some critical prerequisites for roadmapping are missing, we believe there are immediate and near-term actions the Army can take to make better use of information and analysis currently available and promote networking and information sharing among users of research across the Army. If sustained, these first steps will build the path toward systemwide improvement in knowledge management, including the development and implementation of a QOL research roadmap. Figure 5.2 illustrates a set of steps the Army might take to improve knowledge management. The steps, though presented in a linear fashion, are individually and collectively iterative in practice to continuously improve Army QOL soldier and family research knowledge management. Terms (lexicon) and metrics might require revision over time. Literature reviews to establish the knowledge base, too, must be regularly updated. Likewise, holistic assessment of needs and other steps must be revisited on a regular basis for up-to-date and relevant information and analysis. This proactive, iterative approach to knowledge management ensures alignment of research with user needs and Army objectives over time.

Some of the research activities undertaken for this study are in fact consistent with the steps in Figure 5.2 and serve to set the Army on the path. We defined our scope (what is QOL) and set rough boundaries around it. We performed a focused, high-level literature review. Our discussion with policy and program officials about their research needs and how well they are met by current research could be regarded as a preparatory step in socializing culture to align research. In executing the steps in Figure 5.2, we propose that the Army conduct the following activities in sequence, building on information and analysis produced in each step to advance the next. In addition, feedback loops should be incorporated as appropriate.

Figure 5.2
Steps for Army QOL Soldier and Family Research Knowledge Management

RAND *TR1256-5.2*
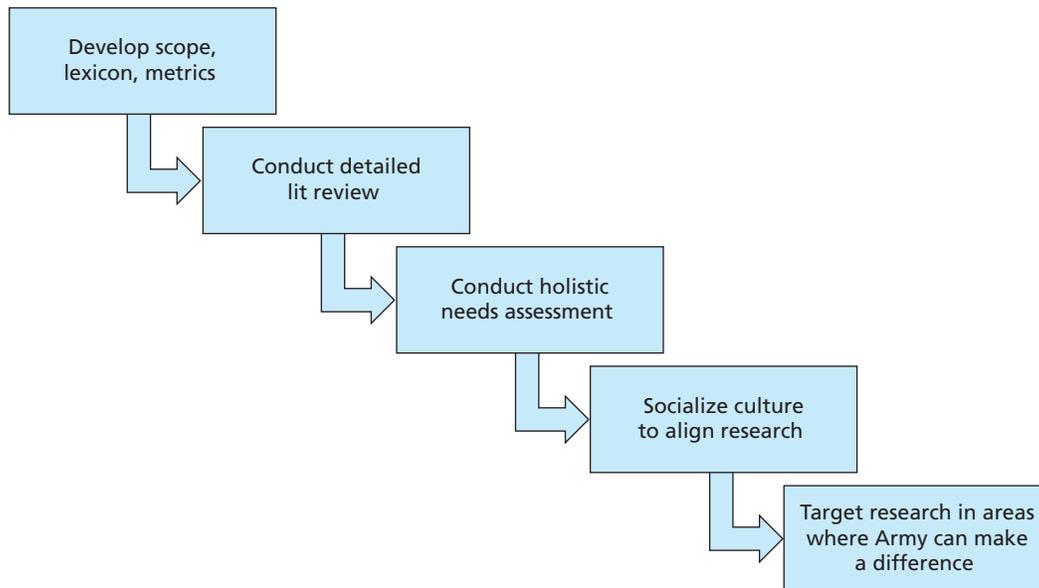
Develop an Agreed-Upon Lexicon, Outcomes, and Metrics

The Army must first identify, within and across domains, the key terms and outcomes of interest (including intermediate outcomes that mediate the path to the Army's strategic goals) and develop explicit definitions for them. The major Army offices involved in QOL research, policy, and programs should either participate in this effort or be thoroughly consulted to ensure their agreement with the key terms, outcomes, and their definitions. These items—and the metrics to assess them—will provide a foundation for more systematic management of knowledge and its use to inform decisionmaking.

Objective metrics for outcomes like recruiting and retention are not too difficult to identify. Retention and recruiting rates are two options. However, separating the effects of financial incentives and other factors from QOL in their linkages to these outcomes will require additional research. In some cases, there is no commonly accepted definition of some individual perceptions that influence individual decisions such as retention or recruitment. Nevertheless, more general research on QOL, retention, and recruiting, as well as the Army-specific literature, have identified many perceptual and proximal factors that can influence individual decisionmaking. They include job satisfaction, commitment, taste for the Army, and perception of Army support for the family. This extant work may help the Army to develop the needed lexicon, outcomes, and metrics. As for the Army's strategic goal of readiness, the Army can build on existing definitions of readiness that include individual and unit readiness to reach an explicit and broadly accepted definition and define metrics for it.

Among the key terms the Army should clearly define is QOL: the domains (and stressors) it covers, what QOL means in each domain, whether stress or well-being perceptions are the most appropriate focus, and metrics to measure QOL. Examination of what QOL means in the civilian world could be useful. For example, if the Army were to incorporate metrics that are applied broadly in the civilian context, it can benchmark against the civilian world to

gauge any difference between QOL in the Army and in the civilian world and whether any difference (better or worse) has a practical effect and warrants attention. Many interlocutors opined that Army life should be on par with civilian life and that the Army should alleviate negative effects of military-specific stressors such as deployment and PCS moves. If QOL is lower for soldiers and families, effective remedies may be lacking or soldiers and families may not be using what is available. Such research findings have long-term benefit for the Army in program resource allocation and execution, and potentially address the sticky issue of separating wants from needs.

An essential benefit of having a common, well-defined set of metrics is that it will prepare the Army for research to disentangle change influenced by policy decisions from change influenced by new metrics. Moreover, the Army would be in a better position to conduct a comprehensive literature review, inclusive of a holistic perspective as well as domain perspectives, to facilitate development of a research agenda.

Focus Research on Individual Domains to Build the Big Picture

Although QOL encompasses multiple domains, we recommend research to focus on individual domains such as childcare, marital relationships, and financial literacy, rather than an amalgamated approach to QOL. Extant literature on QOL is considerable and generally falls within domains, such as child development, financial literacy, and soldier resilience in the face of deployment. As pointed out in earlier discussion, the complexities and richness in each domain will give the Army the insights necessary to achieve an in-depth understanding of stressors, problems, and needs, develop appropriate responses, gauge their effectiveness, and articulate new research needs. These considerations speak to the need for a comprehensive and systematic literature review, both within and between domains, to inform policy and program decisionmaking.

Using domain research as the foundation, the Army can then develop a big-picture view of QOL. Such a view would be sensitive to relationships between stressors, problems, needs, and effective solutions within and across domains. Simultaneous consideration of multiple domains should also benefit coordinated responses across organizations and programs. Domains that are identified as having the greatest impact on QOL could be targeted for priority intervention.

In addition, taking into account what we learned in this study, we counsel the Army to also bear in mind two considerations in domain research: Army-specificity and research currency. Both have important implications for QOL knowledge management and application of that knowledge.

For the first, the Army should ask whether it truly needs Army-specific research or whether research questions may also apply to other service members and families or civilians. If Army-specificity is not required, there may be relevant program efficacy evidence and other insights in the broader military and civilian literature. Whether it is civilian, broader military, or Army-specific, any research the Army elects to use or fund must display methodological rigor. OSD-sponsored research at Pennsylvania State University to evaluate program effectiveness and the Army HPRR portfolio and evaluation are two examples we found that explicitly push for methodological rigor and a comprehensive and systematic use of evidence-based domain research to more strategically assess the impact of support programs on QOL in the Army.

On the matter of research currency, relevance is again the core issue. For program evaluation at least, past research should not be a problem unless significant changes have been made

to the program itself since the original evaluation. Moreover, some desired effects of the Army's menu of quality of life programs take time to manifest and require longitudinal research to substantiate, and longitudinal research is not quick-turn. Program satisfaction ratings may be a useful variable to monitor over time as a leading indicator of other issues. For example, when satisfaction plummets even as a program stays the same, research might point to the presence of new needs (and expectations) or competition from alternative providers.

Conduct Comprehensive Needs Assessment

Having both domain research and a big picture perspective should prepare the Army for the next task: regular comprehensive needs assessments. Comprehensive needs assessments shift the focus from program-centric evaluations to the aggregated perceptions of individual soldiers and families. This flows from consideration of QOL as an interrelated amalgamation of stressors and responses. Soldiers and families do not cope with problems in a domain in terms of Army programs. Instead, they approach them in terms of a related constellation of issues and accordingly seek resources to deal with them. Soldiers may approach dealing with their needs by obtaining information on relevant resources to address one or more stressors in their lives. They are seeking a solution, e.g., marital counseling, rather than a program, e.g., Strong Bonds. In addition, their choice of resources to use, and the search for additional or alternative resources, may be affected by a multitude of factors that may include cost, time, peer influence, and personal preferences. This beneficiary perspective, as illustrated in Figure 2.1, has important implications for how the Army should view QOL for soldiers and families and its actions to address it. QOL program (supply) design, conduct, marketing, and evaluation have to be complemented by comprehensive needs assessments to understand what soldiers and families need (demand). Comprehensive needs assessment can be especially helpful when stressors occur in multiple domains for the Army to gauge whether there are mechanisms, e.g., system navigators and client advocates, to help soldiers and families to obtain the right mix of resources.

Improve Knowledge Management to Expand Research Use and Identify Important Areas for New Research

Improving access to and use of existing information and analysis by Army officials is the first step toward more research-driven decisionmaking. In the near term, it would increase awareness and promote use of extant research by Army officials. In the long term, awareness of the existing knowledge base and questions that research users want answered will aid Army QOL research planning: deliberate, systematic, and supported management of knowledge about Army QOL will help the Army to determine in a methodical way what research is available, how well it answers questions about soldier and family QOL needs, and what are effective responses to soldier and family QOL needs.

Over time, cumulative domain research expertise among Army QOL researchers and policy and program officials will empower them to discern the relative impact of different domains on soldier and family QOL and even the Army's strategic goals. Such insight would help the Army identify and fill critical knowledge gaps and target research to inform actions that may have the greatest impact on soldier and family QOL and the Army's strategic goals.

Some resources are needed to improve knowledge management. Considering what we learned from interlocutors, additional personnel might be needed to customize the format of information and analysis to make them more readily accessible. Alternatively, it may be neces-

sary to increase personnel to relieve workload in relevant policy offices so that policy and program officials can take more time to find and digest relevant research and to engage in processes prescribed in this study to define lexicon, outcomes, and metrics, establish the knowledge base, conduct comprehensive needs assessments, and ultimately develop and implement a research roadmap. And, of course, resources are needed to pay for improvement in current information and analysis activities and new ones. Increasing personnel and other resource outlays may seem counter to the Army's desire to reduce expenditure. However, if the Army is truly interested in having research-driven QOL programs and aligning QOL research with Army objectives in soldier and family QOL and strategic Army goals, these expenditures should be viewed as an investment to attain near- and long-term benefits for the Army.

Make Army QOL Research Roadmapping a Socialization and Knowledge-Sharing Process

Research roadmapping will deal with some of the issues identified in this study, but not all of them. For example, research roadmaps guide research but are not themselves research and hence do not empirically quantify linkages between QOL and Army strategic goals. Roadmaps also cannot overcome issues in working with human subjects, the timeliness of study results, or the availability of data. These are logistical matters that those involved in roadmapping must account for in the roadmap through timelines and milestones. Roadmapping is a process through which the Army can focus its resources to address major knowledge gaps and improve information and analysis to inform QOL policy and program decisionmaking.

We believe that the *process* of roadmapping is as important as its result. Roadmapping as a process engages participants in a structured and explicit articulation of viewpoints and interests and integrates them to produce an agenda of actions and a plan with a timeline, milestones, and metrics to monitor implementation and progress. In the case of the Army, roadmapping would bring major Army offices involved in producing and using QOL research closer as a community of interest and motivate them to work more collaboratively in research, policy development, and program planning and execution.

At present, while individual Army offices might know of others' existence, they do not always or systematically work collaboratively as a single community or proactively share knowledge. Research users we met did not perceive information and analysis supplied by research producers as helpful. The latter complained about constraints they face in data collection, analysis, and dissemination but also acknowledged that their research does not always reach users in a timely fashion, appear in an accessible format, or even answer their questions. If this disconnect is true and pervasive across the Army, roadmapping may be one way to structure dialogue and improve coordination among Army QOL organizations. Their interactions and the iterative process of roadmapping will encourage a sense of community, knowledge sharing, and a more conscious awareness that their work and organization are parts of a larger and complex web, and that together they will articulate a strategic view on the purpose and direction of Army QOL research.

Target Research in Areas Where the Army Can Make a Difference

Helping the Army to know where it should invest its resources in research is a core component of this study. Based on feedback from our interlocutors and literature review, the Army's basic conceptual model links Army family policies, programs, and services to stressors and their effect on QOL for soldiers and families and, in turn, to recruiting, retention, and readiness. However, reality is far more complicated, as is evident in the literature. Specifically, the Army

has had difficulty explicitly tying various QOL issues directly to strategic outcomes. The path found is typically one mediated by perceptions, satisfactions, and other variables.

Stressors can come in many forms: money problems, childcare needs, marital discord, health problems, and events unique to military life like PCS moves and deployments. Soldiers and families appraise the nature of the problem (i.e., stressor) they face and determine what they need to deal with it. When problems are perceived as related to Army service—as underscored by the Army officials we spoke with—soldiers and families have an added expectation that the Army will help out. In this regard, the Army acknowledges its obligation in the Army Family Covenant, a statement of Army commitment to ensure QOL for soldiers and families.

We recommend that the Army focus on garnering knowledge that will best help inform areas that it has clear control over and potential to effect change. These "interventions," as we call policy, programs, and services in Figure 5.3, should aim to mitigate stressors and meet soldier and family QOL needs. By comparison, the Army has relatively limited control over whether soldiers and families take advantage of the policy remedies offered or use the programs and services provided. The Army also has limited control over soldier and family QOL expectations, although it can use marketing and other kinds of education and outreach to manage expectations. Finally, the Army should develop and implement research-driven standard best practices in its interventions. Since personal preferences and situations can significantly vary and affect personal sense of QOL in complex ways, the Army cannot realistically control QOL at the individual level for every soldier and family.

As for linkages between QOL and the Army's strategic goals, recruiting, retention, and readiness are affected by many perceptual processes at the individual level and are at a psychological and temporal distance from Army QOL policies, programs, and services. Research to date reflects this distance and the indirect nature of the linkage. Considering practical policy and programmatic priorities to use resources wisely to meet soldier and family QOL needs, focusing knowledge management to support comprehensive needs assessment and program evaluation should take precedence. Nevertheless, by taking the big-picture view of both specific domains and the larger network of stress-response relationships that is Army QOL, the Army may more clearly see (and prioritize) those relationships with the largest effect on these strategic goals.

Figure 5.3
Areas for Army Research Investment
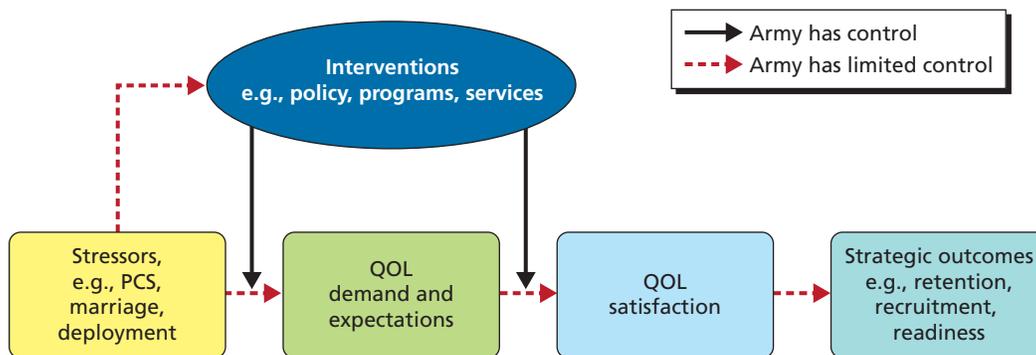
Overall, the Army is further along the road to a roadmap (or a research agenda) than the initial problem statement might suggest. There are steps it can take to move forward, and a more systemic approach that minimizes stovepipes and increases efficiency is within reach. Whether it is roadmapping or other processes to improve Army QOL knowledge management, the process is valuable in and of itself.

List of Organizations Interviewed

Boys and Girls Club of America

National Association of Child Care Resource and Referral Agencies (NACCRRA)

National Military Family Association (NMFA)

Pennsylvania State University, Agriculture and Extension Education

RAND

U.S. Army, Army Community Service

U.S. Army, Installation Management Command (IMCOM), Morale, Welfare and Recreation (MWR)

U.S. Army, Madigan Army Medical Center, Child, Adolescent and Family Behavioral Health Proponency

U.S. Army, Office of the Assistant Secretary of the Army for Manpower and Reserve Affairs (ASA M&RA)

U.S. Army, Office of the Chief of Chaplains (OCCH)

U.S. Department of Defense Education Activity (DoDEA)

U.S. Department of Defense, Office of the Secretary of Defense for Military Community and Family Policy (OSD MC&FP)

U.S. Department of Defense, Office of the Under Secretary of Defense for Personnel and Readiness

University of Arizona, Norton School of Family and Consumer Sciences, Family and Consumer Sciences Cooperative Extension

Protocol for Semi-Structured Discussions with Army and OSD Officials

Background Questions

1. Could you please describe the roles and responsibilities of your office in supporting the Army's effort to provide quality of life (QOL) programs and services to soldiers and families?
2. Can you tell us a bit about your background and education? We're interested in getting a sense of how you approach research generally for your work—are you coming from a particular academic framework or methodological orientation, what particular experiences you would consider most key to shaping your approach, etc.?
3. What decisions and processes is your office involved with respect to providing QOL programs and services to soldiers and families?
4. What is your target population?
5. How do you detect new issues or problems among your population (that you could help address)?

Basic Definitions, Operational Definitions (metrics)

1. How do you define and measure "quality of life"? What general topic areas do you think are covered?
   a. What is *not* covered?
   b. How do you assess QOL? How changeable is it? How often do you measure it?
   c. What programs do you have that are intended to affect QOL?

2. What are the key metrics or indicators for each of your topic areas?
3. The Army is interested in the bottom-line strategic implications of quality of life, i.e., "resilience," retention, job performance. However, those are pretty far downstream in terms of cause and effect from services provided. What do you see as some more immediate or proxy indicators? We're particularly interested in ones that are most pertinent to the mission and goals of your organization.
4. How do you define research?

Research Usage

1. What kind of data or research does your office use to inform your work?
2. What have you used—data sets, particular pieces of research—that you have found most helpful for your work and why? What qualities and characteristics made it particularly helpful?
3. Tell us about the qualities of the least helpful research you have encountered. What qualities and characteristics made it particularly *un*helpful?
4. Overall, how well do existing data sets or research support your work? What are examples that are most helpful and least helpful? What characteristics make them most helpful to you, including content and presentation formats? And what characteristics make them least useful to you?
5. What kind of research on soldier and family QOL research would you like to see to better support your work? Could you describe for us some main features of such research, e.g., issues or questions addressed, frequency at which data is updated, population examined or surveyed, etc.?
6. What major gaps or questions remain to be answered in the area of soldier and family QOL?
7. What are the most important and stable conclusions that can be drawn from the QOL research literature? What studies or research supports these conclusions?
8. What are your views regarding how the Army can better manage its research portfolio, e.g., to ensure the most pertinent issues—existing and emerging—are examined, avoid redundancies, and promote use of the research findings?

Partners at the Table

1. What DoD or Army offices does your office work or coordinate with in these decisions and processes?
2. Who are the major proponents of QOL in the Army? In the DoD? What programs/organizations are most responsible for managing QOL?

Sample Army and OSD Research

Before we talk with you, we'd like to get a sense for some of the pieces of research or data collections that you have found useful in your work. From the list below we'd like you to indicate with an "X" which ones you've found useful in your job. This is not a comprehensive list, so there are a few lines at the bottom for you to indicate other research/data you've found helpful to inform your work.

Research/Data	Have You Used This To Inform Your Work?
Recurring	
Sample Survey of Military Personnel (SSMP)	
Survey of Army Families (SAF)	
Army Community Service (ACS) Needs Assessment	
IMCOM Customer Management Services (CMS): Individuals (ICE)	
DoD MWR Customer Satisfaction Index	
Status of Forces Survey: Active Duty	
Status of Forces Survey: Reserve Component	
Survey of Active Duty Spouses	
Survey of Reserve Component Spouses	
Longitudinal Study of Active Duty Families	
Survey of Employer Support of the Guard and Reserve	
Redeployment–Unit Risk Inventory (R-URI)	
Survey of Health Related Behaviors Among Active Duty Military Personnel	
Health Care Survey of DoD Beneficiaries–Adult	
Health Care Survey of DoD Beneficiaries–Child	
Leisure Needs Survey	
Non-Recurring Surveys/Studies	
Leisure Market Survey (LMS); FMWRC	
Army Family Covenant Survey; FMWRC	
QuickCompass Surveys (through DMDC)	
Military Family Life Project (OSD)	

Research/Data	Have You Used This To Inform Your Work?
Family Support Survey (FSS)//Cycles of Deployment Survey (CoD)—NMFA surveys	
Understanding Soldier and Family Needs: A New Approach for Assessment (Rostker and Miller/RAND)	
Military Family Research Institute at Purdue University studies	
Non-Recurring Compendia/Reviews	
Military Family Research Institute 2003 Bibliography	
What We Know About Army Families: 2007 Update (Caliber summary of research)	
Others You Have Found Useful to Inform Your Work	

Protocol for Semi-Structured Discussions with Non-DoD Respondents

1. Could you please describe the types of research you have done on soldier and family QOL issues?

2. Can you please name the types or titles of research on soldier and family QOL issues that you think have been most important to improving understanding of soldier and family needs and the kinds of QOL programs and services that can help them?

3. Could you tell us who are the users of such research (in response to Q1 and Q2) and how are they used?

4. How do you think such research has contributed to improving understanding of soldier and family QOL issues? For example, was it the collection of data that provided new information, or was it analytical methods that imparted new insight into soldier and family problems and needs or the solutions to them and their costs?

5. As soldier and family problems and needs can change over time, what would you say are areas that future research on soldier and family QOL issues should pay attention to? (This may include collection of new data sets, mining existing data, and studying particular subject matters.)

6. What are your views on how the Army can better manage its research portfolio, e.g., to ensure the most pertinent issues—existing and emerging—are examined, avoid redundancies, and promote use of the research findings?

Some Definitions of Research from Federal Regulations

Federal regulations typically separate research into several categories. Applied research focuses on developing and demonstrating a technology solution. Fundamental or basic research is long-term research to advance a knowledge area or understanding of a problem.

One federal definition of research and development (R&D) activities appears in the Office of Management and Budget (OMB) Circular A-133 Subpart A-General, Section 105. The same definition is also found in OMB Circular A-110 Subpart A-General, Section 2, and OMB Circular A-21 Section B.1b.[1] Research is defined as

> A systematic study directed toward fuller scientific knowledge or understanding of the subject studied. The term research also includes activities involving the training of individuals in research techniques where such activities utilize the same facilities as other research and development activities and where such activities are not included in the instruction function.

Further, federal definitions separate research into two types: basic and applied. Basic research is a "systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind." By comparison, applied research is a "systematic study to understand the means to meet a recognized and specific need. It is a systematic expansion and application of knowledge to develop useful materials, devices, and systems or methods" (DoD, 2010). For DoD, this distinction carries particular significance because DoD funds for these two types of research are distinct. The former is covered by "6.1" category funds, the latter by "6.2" category funds. For the Army's interest in advancing QOL research, recognizing this distinction can benefit its access to and allocation of research dollars. In 2004, Congress directed the National Academies of Science (NAS) to examine whether "the programs in the DoD basic research portfolio are consistent with the DoD definition of basic research and with the characteristics associated with fundamental research." NAS did not find a significant amount of 6.1 funds for basic research directed toward projects that are typical of applied research funded under category 6.2 (or category 6.3 for technology development). However, NAS concluded that this definition for basic research is "not a useful criterion for discriminating between basic and applied research" because it precludes having "specific applications . . . in mind." NAS recommended DoD recognize that while basic research "has the potential for broad, rather than

---

[1]   Note that research by Fossum et al. (2000) suggests that there are variations in how organizations and people across the government interpret this definition. Thus, what is considered a research activity in one government agency may not be similarly viewed in another.

specific, application . . . [it] may lead to . . . the discovery of new knowledge that may later lead to more focused advances" (National Academies Press, 2005).

Insight into the definition of research is also found in the literature pertaining to ethical treatment of human participants in research. Specifically, Title 45 Common Rule Subpart A 46 states that "*[r]esearch* means a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge." Thus, activities that meet this definition constitute research regardless of whether they are conducted for or supported under a program (Department of Health and Human Services).

Another definition of research is found in the No Child Left Behind Act of 2011 (Department of Education). This act defines research as involving the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs. From this, it is clear that reliability (i.e., results are repeatable across occasions or observers) and validity (i.e., appropriate and supportable inferences about the data are drawn) of data—the hallmarks of scientifically based research—are key characteristics of research within the context of this federal regulation.

Major Reference Research Roadmaps

Roadmap for Cybersecurity Research (U.S. Department of Homeland Security, 2009). The goal of this roadmapping effort is to define a national R&D agenda to enable the United States to get ahead of adversaries and produce the technologies that will protect U.S. information systems and networks into the future:

> The intent of this document is to provide detailed research and development agendas for the future relating to 11 hard problem areas in cybersecurity, for use by agencies of the U.S. Government and other potential R&D funding sources.[1]

Given that the Department of Homeland Security (DHS) did *not* commit implementation resources to this effort, a primary value of this roadmapping effort lies in raising the profile of this threat in an increasingly networked world and in bringing together the research and policy communities to consider how best to understand this threat and respond to it. Also, it raised the profile of DHS as a key player in cybersecurity.

National Earthquake Hazards Reduction Program (NEHRP) Research and Development Roadmap (Applied Technology Council, 2003). The NEHRP Reauthorization Act of 2004

> assigns NIST [National Institute of Standards and Technology] significant [R&D] responsibilities to improve building codes and standards and practices for structures and lifelines. The central driver is a desire to close the gap between engineering and scientific knowledge on one hand and practical application on the other. At the request of NIST, the Applied Technology Council (ATC) developed an R&D roadmap in 2003 (which became operational in 2007) to address the research-to-implementation gap.

This R&D roadmap assumes direct involvement of NEHRP in funding the research priorities identified. The research priorities are explicitly tied to each of the five program elements that speak to practical needs in the design and construction industries. For example, "subject area 2," to improve seismic design and construction productivity, is associated with "program

---

[1]   These areas are (1) scalable trustworthy systems (including system architectures and requisite development methodology), (2) enterprise-level metrics (including measures of overall system trustworthiness), (3) system evaluation life cycle (including approaches for sufficient assurance), (4) combatting insider threats, (5) combatting malware and botnets, (6) global-scale identity management, (7) survivability of time-critical systems, (8) situational understanding and attack attribution, (9) provenance (relating to information, systems, and hardware), (10) privacy-aware security, and (11) usable security.

element 3," to support development of technical resources (guidelines and manuals) to improve seismic engineering practices and also with "program element 4," to make evaluated technologies available to practicing professionals in the design and construction industries.

Arup Roadmap 2010 (Fernandes, Ralph, and Voukalis, 2010). Arup is a global design, planning, and engineering consultant group. It developed a roadmap to identify knowledge gaps and actions required to maximize business potential. This roadmap serves as a "strategic research plan . . . to develop and articulate a corporate research strategy." The research priorities identified are to meet short- and long-term business objectives. Research priorities are set against a timeline that stretches from the short term (ending in 2012, or two years out) to the medium term (ending in 2019, nine years out) and the long term (ending in 2039, 29 years out), and short- and long-term business objectives are aligned against these research priorities. The roadmap's framework also seeks to identify drivers (e.g., regulations, demand, supply) in each of the three time phases, and it spells out key research elements (e.g., water management, waste heat generation, recycling) in each phase. Arup uses the research roadmap to guide allocation of its internal and external collaborative research funding.

European Council-Funded Aging Research Roadmap (University of Sheffield Media Centre, 2011; see also Oasis Project, 2012). The objective is to identify the main priorities for research on aging "with the aim of creating a better old age for Europe's aging population." The European Commission funded this research as part of its 7th Framework Programme for research and technological development. There was no explicit definition for QOL other than recognition of issues within the domain of elder care. Research priorities identified include understanding the relationship between income and health status, support for working family caretakers, planning for accessible housing and public transportation, and development of age-specific medical and pharmaceutical products. The University of Sheffield coordinated development of this research roadmap.

National Institute for Occupational Safety and Health (NIOSH) Roadmap for Research on Asbestos Fibers and Other Elongated Mineral Particles (National Research Council, 2009). This roadmap was released for public comment in February 2007 and submitted for a review by a panel of experts organized by the National Research Council (NRC). The research program outlined in this roadmap reflects the interagency and interdisciplinary nature of the research questions because NIOSH is not the only agency involved in asbestos research. NRC's recommendations spoke to some fundamental weaknesses in the NIOSH research roadmap. NRC recommended that the roadmap have (1) an overarching vision, (2) a rationale for a research roadmap that emphasizes public and occupational health, (3) explicitly articulated research goals, and (4) a research framework that contains a systematic plan for conducting the research.

References

Aldridge, D. M., T. T. Sturdivant, C. L. Smith, J. A. Lago, and B. D. Maxfield, *Individual & Family Readiness for Separation and Deployment: Results from the 1992 DoD Surveys of Officers & Enlisted Personnel & Military Spouses*, Arlington, Va.: Defense Manpower Data Center, 1997.

Allen, N. J., and J. P. Meyer, "Affective, Continuance, and Normative Commitment to the Organization: An Examination of Construct Validity," *Journal of Vocational Behavior*, Vol. 49, No. 3, 1996, pp. 252–276. As of November 3, 2011:
http://www.ncbi.nlm.nih.gov/pubmed/8980084

Applied Technology Council, *The Missing Piece: Improving Seismic Design and Construction Practices*, 2003. As of November 3, 2011:
http://www.nehrp.gov/pdf/atc57.pdf

Beer, M., and R. A. Eisenstadt, "Developing an Organization Capable of Implementing Strategy and Learning," *Human Relations*, Vol. 49, No. 5, 1996, pp. 597–619.

Bell, D. B., and W. R. Schumm, "Family Adaptation to Deployments," in P. McClure (ed.), *Pathways to the Future: A Review of Military Family Research*, Marywood University, Scranton, Pa.: Military Family Institute, 1999, pp. 109–132.

Bennett R., *Defining Accelerated Pathways to Success: Using the Roadmapping Process to Overcome Barriers and Find the Most Cost-Effective and Timely Technical and Programmatic Solutions*, Idaho National Engineering and Environmental Laboratory, undated. As of November 3, 2011:
http://emiweb.inel.gov/roadmap/factsheet.pdf

Booth, B., M. W. Segal, D. B. Bell, J. A. Martin, M. G. Ender, D. Rohall, et al., *What We Know About Army Families: 2007 Update*, Fairfax, Va.: Caliber, 2007.

Bowen, G. L., and P. McClure, "Military Communities," in P. McClure (ed.), *Pathways to the Future: A Review of Military Family Research*, Marywood University, Scranton, Pa.: Military Family Institute, 1999, pp. 11–34.

Bowen, G. L., and D. K. Orthner, "Differences in Spouses' Perceptions of Family Adaptation," *Journal of Social Behavior & Personality,* Vol. 12, 1997, pp. 53–72.

Bowen, G. L., J. A. Mancini, J. A. Martin, W. B. Ware, and J. P. Nelson, "Promoting the Adaptation of Military Families: An Empirical Test of a Community Practice Model," *Family Relations*, Vol. 52, 2003, pp. 33–44.

Bromfield, L., and F. Arney, "Developing a Road Map for Research: Identifying the Priorities for a National Child Protection Research Agenda," *Child Abuse Prevention Issues,* Vol. 28, 2008. As of November 3, 2011: http://www.aifs.gov.au/nch/pubs/issues/issues28/issues28.html

Buddin, Richard, *Building a Personnel Support Agenda: Goals, Analysis Framework, and Data Requirements*, Santa Monica, Calif.: RAND Corporation, MR-916-OSD, 1998. As of November 3, 2011:
http://www.rand.org/pubs/monograph_reports/MR916.html

Burke, S. C., "Family Readiness," in P. McClure (ed.), *Pathways to the Future: A Review of Military Family Research*, Marywood University, Scranton, Pa.: Military Family Institute, 1999, pp. 209–231.

Burnam, M. Audrey, Lisa S. Meredith, Cathy D. Sherbourne, Robert B. Valdez, and Georges Vernez, *Army Families and Soldier Readiness*, Santa Monica, Calif.: RAND Corporation, R-3884-A, 1992. As of February 1, 2012:
http://www.rand.org/pubs/reports/R3884.html

Campbell, Donald T., and Julian C. Stanley, *Experimental and Quasi-Experimental Designs for Research*, Belmont, Calif.: Wadsworth Publishing, 1963.

Castaneda, Laura Werber, Margaret C. Harrell, Danielle M. Varda, Kimberly Curry Hall, Megan K. Beckett, and Stefanie Stern, *Deployment Experiences of Guard and Reserve Families: Implications for Support and Retention*, Santa Monica, Calif.: RAND Corporation, MG-645-OSD, 2008. As of February 1, 2012:
http://www.rand.org/pubs/monographs/MG645.html

Chemical Industry Vision2020 Technology Partnership, *Chemical Industry R&D Roadmap for Nanomaterials by Design: From Fundamentals to Function*, 2003. As of November 3, 2011:
http://www.nanowerk.com/nanotechnology/reports/reportpdf/report17.pdf

Code of Federal Regulations, Title 45: Public Welfare, Department of Health and Human Services, Part 46: Protection of Human Subjects, revised January 15, 2009, effective July 14, 2009. As of August 14, 2012:
http://www.hhs.gov/ohrp/policy/ohrpregulations.pdf

Demarest, Marc, "Understanding Knowledge Management," *Long Range Planning*, Vol. 30, No. 3, 1997, pp. 374–385.

Dougherty, L. M., "Transition into the Military: Issues for the Junior Enlisted and Junior Officer Members and Families," in P. McClure (ed.), *Pathways to the Future: A Review of Military Family Research*, Marywood University, Scranton, Pa.: Military Family Institute, 1999, pp. 67–86.

Eby, Lilian T., Carrie S. Hurst, and Marcus M. Butts, "Qualitative Research: The Redheaded Stepchild in Organizational and Social Science Research?" in Charles E. Lance and Robert J. Vandenberg (eds.), *Statistical and Methodological Myths and Urban Legends: Doctrine, Verity and Fable in Organizational and Social Sciences*, New York: Rutledge, 2009, pp. 219–239.

European Commission Research Directorate-General, *FP7 Socio-economic Sciences and Humanities Indicative Strategic Research Roadmap 2011–2013*, no date. As of November 3, 2011:
ec.europa.eu/research/social-sciences/pdf/roadmap-2011-2013-final_en.pdf

Fafara, Richard J., Joanne C. Marshall-Mies, and David J. Westhuis, "Ground-Breaking Study Confirms Army Morale, Welfare and Recreation Programs Linked to Soldier Readiness and Retention," *U.S. Army Journal of Installation Management*, Vol. 4, 2009, pp. 28–33.

Fernandes, Marta, Geraldine Ralph, and Nausicaa Voukalis, *Research Roadmap*, London: Arup, 2010.

Fernandez, Sergio, and Hal G. Rainey, "Managing Successful Organizational Change in the Public Sector: An Agenda for Research and Practice," *Public Administration Review*, Vol. 66, No. 2, March/April 2006, pp. 168–176.

Folkman, Susan, and Judith Tedlie Moskowitz, "Coping: Pitfalls and Promise," *Review of Psychology,* Vol. 55, 2004, pp. 745–774.

Fossum, Donna, Lawrence S. Painter, Valerie L. Williams, Allison Yezril, and Elaine M. Newton, *Discovery and Innovation: Federal Research and Development Activities in the Fifty States, District of Columbia, and Puerto Rico*, Santa Monica, Calif.: RAND Corporation, MR-1194-OSTP/NSF, 2000. As of October 2, 2011:
http://www.rand.org/pubs/monograph_reports/MR1194.html

FUTURAGE Road Map for European Ageing Research, *A Road Map for European Ageing Research*, October 2011. As of November 3, 2011:
http://futurage.group.shef.ac.uk/road-map-flip-book.html

Garcia, Marie L., and Olin H. Bray, *Fundamentals of Technology Roadmapping*, Albuquerque, N.M.: Sandia National Laboratories, 1997.

Griffith, J. D., S. Rakoff, and R. F. Helms, *Report on Family and Other Impacts on Retention* (Technical Report 986), Alexandria, Va.: U.S. Army Research Institute for the Behavioral and Social Sciences, 1993.

Hansen, Michael L., and Jennie W. Wenger, with Anita Hattiangadi, *Return on Investment of Quality of Life Programs*, CNA Corporation (CRM D0006807.A2), October 2002.

Harrell, Margaret C., and Laura L. Miller, *New Opportunities for Military Women: Effects upon Readiness, Cohesion, and Morale*, Santa Monica, Calif.: RAND Corporation, MR-896-OSD, 1997. As of February 1, 2012:
http://www.rand.org/pubs/monograph_reports/MR896.html

Heffner, T. S., and P. A. Gade, "Commitment to Nested Collectives in Special Operations Forces," *Military Psychology*, Vol. 15, 2003, pp. 209–224.

Hom, P., and R. Griffeth, *Employee Turnover*, Cincinnati, Ohio: Southwestern, 1995.

Hosek, James R., *Insights from Early RAND Research on Deployment: Effects on U.S. Service Members and Their Families, testimony presented before the Senate Veterans' Affairs Committee*, Santa Monica, Calif.: RAND Corporation, CT-367, July 2011. As of November 3, 2011:
http://www.rand.org/pubs/testimonies/CT367.html

Hosek, James R., and Francisco Martorell, *How Have Deployments During the War on Terrorism Affected Reenlistment?* Santa Monica, Calif.: RAND Corporation, MG-873, 2009. As of July 26, 2012:
http://www.rand.org/pubs/monographs/MG873.html

Hosek, James R., Jennifer Kavanagh, and Laura L. Miller, *How Deployments Affect Service Members*, Santa Monica, Calif.: RAND Corporation, MG-432-RC, 2006. As of February 1, 2012:
http://www.rand.org/pubs/monographs/MG432.html

Huffman, Ann H., Satoris S. Culbertson, and Carl A. Castro, "Family-Friendly Environments and U.S. Army Soldier Performance and Work Outcomes," *Military Psychology*, Vol. 20, 2008, pp. 253–270.

Lazarus, Richard S., and Susan Folkman, *Stress Appraisal and Coping,* New York: Springer Publishing Company, 1984.

Leitzel, Jeffrey D., and Richard Zaler, "Military Adolescents," in P. McClure (ed.), *Pathways to the Future: A Review of Military Family Research,* Scranton, Pa.: Military Family Institute of Marywood University, 1999, pp. 183–208.

Lombard, M., J. Snyder-Duch, and C. C. Bracken, "Content Analysis in Mass Communication: Assessment and Reporting of Intercoder Reliability," *Human Communication Research*, Vol. 28, 2002, pp. 587–604.

Lorge, Elizabeth M., "Army Leaders Sign Covenant with Families," October 17, 2007. As of April 2013:
http://www.army.mil/article/5641/army-leaders-sign-covenant-with-families

Ma, T., S. Liu, and Y. Nakamori, "Roadmapping as a Way of Knowledge Management for Supporting Scientific Research in Academia," *Systems Research and Behavioral Science*, Vol. 23, 2006, pp. 743–755.

Mankins, John C., "Approaches to Strategic Research and Technology Analysis and Road Mapping," *Acta Aeronautica*, Vol. 51, No. 1-9, 2002, pp. 3–21.

Marshall-Mies, Joanne C., David J. Westhuis, and Richard J. Fafara, "U.S. Army Morale, Welfare and Recreation (MWR) Programmes: Links to Readiness and Retention," *Res Militaris*, Vol. 1, No. 3, 2011, pp. 1–22.

Matthews, P. A., *Military Family Institute of Marywood University*, 1998. As of November 3, 2011:
http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ada356796.pdf&Location=U2&doc=GetTRDoc.pdf

McClees, C. W., "Motorola's Technology Roadmap Process," *Research Management*, Vol. 30, No. 5, 1987, pp. 13–19.

McClure, P. (ed.), *Pathways to the Future: A Review of Military Family Research*, Marywood University, Scranton, Pa.: Military Family Institute, 1999. As of November 3, 2011:
http://handle.dtic.mil/100.2/ADA364886

McGonigle, T. P., W. J. Casper, E. P. Meiman, C. B. Cronin, B. E. Cronin, and R. R. Harris, "The Relationship Between Personnel Support Programs and Readiness: A Model to Guide Future Research," *Military Psychology*, Vol. 17, 2005, pp. 25–39.

McHugh, J. M., and G. W. Casey, Jr., *America's Army: The Strength of the Nation: 2010 Army Posture Statement*, 2010. As of November 3, 2011:
http://www.au.af.mil/au/awc/awcgate/army/armyposture2010.pdf

Miller, Laura L., Bernard Rostker, Rachel M. Burns, Dionne Barnes-Proby, Sandraluz Lara-Cinisomo, and Terry R. West, *A New Approach for Assessing the Needs of Service Members and Their Families*, Santa Monica, Calif.: RAND Corporation, MG-1124-OSD, 2011. As of February 1, 2012:
http://www.rand.org/pubs/monographs/MG1124.html

Molinaro, Kristin, "Army Family Covenant: Keeping the Promise," *The Bayonet*, January 16, 2001. As of October 2012:
http://www.army.mil/article/50836/Army_Family_Covenant__Keeping_the_promise/

National Academies Press (NAP), *Assessment of Department of Defense Basic Research*, Washington, D.C.: National Research Council, 2005.

National Institute for Occupational Safety and Health (NIOSH), *Asbestos Fibers and Other Elongate Mineral Particles: State of the Science and Roadmap for Research—Version 4* (NIOSH No. 099-C), 2010. As of November 3, 2011:
http://www.cdc.gov/niosh/review/public/099-C/pdfs/
AsbestosRoadmapPublicCommentDraftV4.pdf

Oasis Project, *Road Map for European Ageing Research,* 2012. As of June 18, 2012:
http://www.oasis-project.eu/index.php/lang-en/news-topmenu-19/
20-general-news/400-road_map_for_european_ageing_research

Office of Management and Budget, *Circular A-110: Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations*, undated. As of November 3, 2011:
http://www.whitehouse.gov/omb/circulars_default

Office of Management and Budget, *Circular A-133: Audits of States, Local Governments, and Non-Profit Organizations*, undated. As of November 3, 2011:
http://www.whitehouse.gov/omb/circulars_default

Office of Management and Budget, *Circular A-21: Cost Principles for Educational Institutions*, 2004. As of November 3, 2011:
http://www.whitehouse.gov/omb/circulars_default

Office of the Secretary of Defense, *2004 Quadrennial Quality of Life Review*, 2004.

Office of the Secretary of Defense, *2009 Quadrennial Quality of Life Review*, 2009.

Orthner, D. K., *Family Impacts on the Retention of Military Personnel*, Alexandria, Va.: Army Research Institute for the Behavioral and Social Sciences, 1990.

Orthner, D. K., *Family Readiness Support and Adjustment Among Army Civilian Spouses: Survey of Army Families IV, Survey Report*, 2002. As of November 3, 2011:
http://www.armymwr.com/corporate/operations/planning/surveys

Peterson, M., *Survey of Army Families IV: Final Executive Summary*, Alexandria, Va.: U.S. Army Research Institute for the Behavioral and Social Sciences, 2002. As of April 18, 2002:
http://www.armymwr.com/corporate/operations/planning/surveys

Phaal, R., C. J. P. Farrukh, and D. R. Probert, "Strategic Roadmapping: A Workshop-based Approach for Identifying and Exploring Innovation Issues and Opportunities," *Engineering Management Journal*, Vol. 19, No. 1, 2007, pp. 16–24.

Pierce, Jon L., Tatiana Kostova, and Kurt T. Dirks, "Toward a Theory of Psychology of Ownership in Organizations," *The Academy of Management Review*, Vol. 26, No. 2, April 2001, pp. 298–310.

Russo, T. J., "Family Stress and Adaptation," in P. McClure (ed.), *Pathways to the Future: A Review of Military Family Research*, Marywood University, Scranton, Pa.: Military Family Institute, 1999, pp. 87–108.

Sackett, P., and A. Mavor (eds.), *Attitudes, Aptitudes, and Aspirations of American Youth: Implications for Military Recruitment*, Washington, D.C.: National Academies Press, 2003.

Sadacca, R., and A. S. DiFazio, *Analysis of Army Family Research Program Measures of Individual Readiness: U.S. Army Research Institute for the Behavioral and Social Sciences*, U.S. Army Research Institute for the Behavioral, Social Sciences, Personnel Utilization Technical Area, Social Sciences, Manpower, and Personnel Research Laboratory, 1991.

Sadacca, R., R. A. McCloy, and A. S. DiFazio, *The Impact of Army and Family Factors on Individual Readiness*, 1993. As of November 3, 2011:
http://handle.dtic.mil/100.2/ADA269458

Schumm, W. R., "Reserve Component Families," in P. McClure (ed.), *Pathways to the Future: A Review of Military Family Research*, Marywood University, Scranton, Pa.: Military Family Institute, 1999, pp. 285–302.

Schumm, W. R., D. B. Bell, and P. A. Gade, "Effects of a Military Overseas Peacekeeping Deployment on Marital Quality, Satisfaction, and Stability," *Psychological Reports*, Vol. 87, 2000, pp. 815–821.

Schumm, W., D. B. Bell, and G. Tran, *Family Adaptation to the Demands of Army Life: A Review of Findings* (Research Report 1658), Alexandria, Va.: U.S. Army Research Institute for the Behavioral and Social Sciences, 1994.

Schwarz, R. L., et al., *Compendium of Quality of Life Research, 1996–2003: An Annotated Bibliography,* West Lafayette, Ind.: Military Family Research Institute, 2003.

Segal, M. W., and J. J. Harris, *What We Know About Army Families*, Alexandria, Va.: Army Research Institute for the Behavioral and Social Sciences, 1993.

Segal, Mady Wechsler, and David R. Segal, "Implications for Military Families of Changes in the Armed Forces of the United States," in Giuseppe Caforio (ed.), *Handbooks of the Sociology of the Military*, New York: Springer Science + Business Media, 2006, pp. 225–233.

Shaker, P., and C. W. Ruitenberg, "Scientifically-Based Research: The Art of Politics and the Distortion of Science," *International Journal of Research & Methods in Education*, Vol. 30, No. 2, 2007, pp. 207–219.

Sloman, Aaron, "What's a Research Roadmap for? Why Do We Need One? How Can We Produce One?" paper presented at the euCognition Meeting in Munich, Germany, January 12, 2007. As of November 3, 2011:
http://www.cs.bham.ac.uk/research/projects/cosy/presentations/munich-roadmap-0701.pdf

Sparacino, Linette R., James A. Martin, and Leora N. Rosen, *The Military Family: A Practice Guide for Human Service Providers*, Westport, Conn.: Praeger, 2000. As of November 3, 2011:
http://www.dtic.mil/docs/citations/ADA356796

Strauss, Jeffrey D., and Michael Radnor, "Roadmapping for Dynamic and Uncertain Environments," *Research Technology Management*, March–April 2004, pp. 51–58. As of November 3, 2011:
http://www.technologyforge.net/STMWarsaw/TechnologyRoadmapping/ENMA291TRReferences/RoadmapScenario.pdf

Tucker, J. S., R. R. Sinclair, and J. L. Thomas, "The Multilevel Effects of Occupational Stressors on Soldiers' Well-Being, Organizational Attachment, and Readiness," *Journal of Occupational Health Psychology*, Vol. 10, 2005, pp. 276–299.

U.S. Army, "Army FY2012 Budget Request," 2012. As of January 4, 2012:
asafm.army.mil/Documents/OfficeDocuments/Budget/BudgetMaterials/FY12//abr.pdf

U.S. Army, *2004 Army Transformation Roadmap*, 2004. As of November 3, 2011:
http://www.dtic.mil/futurejointwarfare/strategic/army_trans_roadmap.pdf

U.S. Army, *White Paper 1983: The Army Family,* 1983. As of November 3, 2011:
http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA143245&Location=U2&doc=GetTRDoc.pdf

U.S. Army, UAS Center of Excellence, *Eyes of the Army, U.S. Army Roadmap for Unmanned Aircraft Systems 2010–2035*, undated. As of November 3, 2011:
http://www.fas.org/irp/program/collect/uas-army.pdf

U.S. Department of the Army, *2010 Army Posture Statement*, 2010. As of November 3, 2011:
https://secureweb2.hqda.pentagon.mil/vdas_armyposturestatement/2010/

U.S. Department of the Army, *2011 Army Posture Statement*, 2011. As of November 3, 2011:
http://www.au.af.mil/au/awc/awcgate/army/armyposture2011.pdf

U.S. Department of Defense, *DoD Financial Management Regulation*, DOD 7000.14-R, Vol. 2B, Chap. 5, December 2010. As of November 3, 2011:
http://comptroller.defense.gov/fmr/current/02b/02b_05.pdf

U.S. Department of Education, *No Child Left Behind Act of 2001*, undated. As of November 3, 2011:
http://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf

U.S. Department of Health and Human Services, *Federal Policy for the Protection of Human Subjects ("Common Rule"),* undated. As of November 3, 2011:
http://www.hhs.gov/ohrp/humansubjects/commonrule/index.html

U.S. Department of Homeland Security, *A Roadmap for Cybersecurity Research*, 2009. As of November 3, 2011:
http://www.cyber.st.dhs.gov/docs/DHS-Cybersecurity-Roadmap.pdf

University of Sheffield Media Centre, "Experts Produce Ageing Research Road Map," 2010. As of November 3, 2011:
http://www.sheffield.ac.uk/mediacentre/2010/1613.html

Westfall, John M., James Mold, and Lyle Fagnan, "Commentary: Practice-based Research—'Blue Highways' on the NIH Roadmap," *Journal of the American Medical Association*, Vol. 297, No. 4, 2007, pp. 403–406.

Wilcove, G. L., M. J. Schwerin, and D. G. Wolosin, "An Exploratory Model of Quality of Life in the U.S. Navy," *Military Psychology*, Vol. 15, No. 2, 2003, pp. 133–152.

Willyard, C. H., and C. W. McClees, "Motorola's Technology Roadmap Process," *Research Management*, September–October, 1987, pp. 13–19.

The Army spends hundreds of millions of dollars annually on soldier and family support or quality of life (QOL) programs intended to ease the stress of military life and thereby enhance well-being, improve readiness, and sustain recruiting and retention. However, research in support of these programs to determine needs, access, and effectiveness is fragmented, duplicative, and at times lacking in quality or depth of analysis. The Army leadership wants to develop a research agenda to inform the Army of the QOL needs of soldiers and families, help gauge the success of programs, improve coordination of research efforts, and determine how best to allocate resources to achieve its objectives. This analysis concludes that the Army currently lacks a clear awareness of relevant research on soldier and family QOL, and it also lacks the institutional mechanisms and resources to systematically collect and synthesize data and analysis to inform decisionmaking. Furthermore, both domain-specific research and a broader, more holistic understanding of QOL—to put domain-specific research in context—are critical. As a first step, the authors recommend that the Army develop an explicitly agreed-upon lexicon, outcomes, and metrics to identify and develop relevant research to inform intra- and interorganizational discussions and decisionmaking on QOL. The Army should also consider adopting a comprehensive approach to needs assessment to develop a holistic picture of support service gaps and their relative importance to well-being.

OBJECTIVE ANALYSIS.
EFFECTIVE SOLUTIONS.

RAND publications are available at www.rand.org

$22.50

ISBN 978-0-8330-7789-9
52250

9 780833 077899

TR-1256-A