This chapter presents a framework for measuring and evaluating personnel readiness and for examining the relationship between resources and personnel readiness. We start by placing personnel readiness in an overall hierarchy of readiness inputs and outputs. We then define the attributes that contribute to its measurement and prediction. We next describe how these attributes are affected by various OSD and Service activities. It is these activities that require resources. We conclude the chapter with an initial list of the various models used by the Services and OSD to manage their personnel activities.

PERSONNEL READINESS IS AN INPUT TO OVERALL FORCE READINESS

Numerous research efforts, many in recent years, have examined various aspects of readiness. A common thread in much of this research is that readiness is not a simple concept that is easily defined and measured.\(^1\) Most attempts at defining readiness focus on the capability of a military force, or on the ability of that force to accomplish specified missions and goals.

Readiness is often described as an output measure; that is, readiness is a capability that results from various personnel, equipment, train-

Relating Resources to Personnel Readiness

It is also typically easier, because of the difficulty in defining and understanding the concept of readiness, to address readiness issues by focusing on the various “pieces” that make up readiness. This input/output relationship, when viewed in the context of what composes a military force, suggests that there is a hierarchy of readiness “levels” where one level of the hierarchy provides the inputs to the next higher level. Personnel readiness is at the bottom of this hierarchy. It is one of the basic inputs that feeds the overall readiness of the force. Figure 2.1 depicts this hierarchy.

At the top of the hierarchy is the readiness of the force or the ability of the overall force to perform a given mission successfully. A force is composed of units from the active and reserve components of the

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2The Status of Resources and Training System (SORTS) is the joint system used by all the Services to measure the readiness of their units. One common criticism of SORTS is that it measures inputs, not outputs.
various military Services. Therefore, the Service readiness levels for their active and reserve component units are inputs for determining the readiness of the force.

But a force is also composed of joint capabilities, many of which are provided by units of the individual Services. For example, strategic mobility is considered a joint capability but is provided by units, personnel, and equipment of the Army, Navy, and Air Force. The joint world also contributes infrastructure and command, control, communications, computer systems, and intelligence (C^4) capabilities. As with the Services, the readiness measures for these joint capabilities serve as inputs to determining the readiness of the overall force.

A military Service is composed of a collection of units. The readiness of the separate units can be combined into an overall readiness measure for the Service. The distinction between unit and Service readiness is important because a Service can, and often will, cross-level people and equipment to increase the readiness of specific units. It is possible that two “less ready” units can be “combined” to make one “more ready” unit and one “less ready” unit. Therefore, the readiness of individual units is an input to determining the overall readiness of a Service.

Because SORTS is the widely used measure of military readiness, readiness issues are typically addressed at the unit level. SORTS produces unit “C-levels” that characterize the proportion of the wartime mission the unit can perform. Separate ratings for personnel, materiel, and unit training combine to form an overall unit rating. Therefore, personnel readiness is one component (or input), along

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3Services measure readiness for both active component (AC) and reserve component (RC) units. Since Services may have different resourcing and readiness policies and procedures for their components, it is often useful when thinking about resources-to-readiness issues to keep AC unit readiness separate from RC unit readiness. However, addressing and integrating RC readiness issues are necessary for understanding overall force readiness.

4See, for example, Bruce Orvis, H. J. Shukiar, Laurie McDonald, M. G. Mattock, M. R. Kilburn, and M. G. Shanley, Ensuring Personnel Readiness in the Army Reserve Components, RAND, MR-659-A, 1996. Section 2 of this document examines the cross-leveling in reserve component units mobilized for Operation Desert Shield/Storm.

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with materiel readiness and unit training, in determining the overall readiness of a unit.

Thus, personnel readiness is a fundamental input to unit and, by extension, overall readiness. But personnel readiness receives its own inputs, and questions remain about what these are and how to measure them. Other questions pertain to the factors that affect the personnel readiness measures. We discuss these issues next.

CERTAIN ATTRIBUTES DEFINE PERSONNEL READINESS

Our research focuses on the personnel component of unit readiness. Personnel readiness refers to more than the status of an individual. It represents the collective capability of all the individuals assigned to the unit.

Our research suggests that personnel readiness has five attributes. SORTS measures three of them: the percentage of required unit personnel available to deploy, the percentage of unit personnel qualified in their duty skill, and the experience level of the unit measured by the percentage fill of senior grades. Putting aside the positive and negative aspects of SORTS, most would agree that these measures are important for understanding personnel readiness. Therefore, available, qualified, and experienced are three personnel attributes that contribute to the readiness of both the unit and the Service.

Requirements, or goals, for these attributes are defined by the Services in unit manning documents. These documents specify the numbers of people by skill and grade that are required to perform the unit’s wartime mission. Although exact relationships between the attributes and unit readiness are not easily defined, the general view is “the more, the better,” and the closer a unit’s actual manning comes to the stated goals, the more ready the unit is to perform its mission (or perform it at a higher level).

We believe two other attributes are also important for measuring unit and Service readiness. One is the stability of unit personnel; the other is the motivation of unit personnel, a measure that has received significant attention in recent years. Stability has much in common with experience, but has a different focus. Where experience relates to the longevity of the force, stability relates to a mini-
mization of the turbulence of the personnel in the force. Experienced people have been in the force for some time; stable people have been in their unit and in the same skill position for some time. The advantage of experienced personnel can be offset by low stability.

Recently, the Services and OSD have become concerned with, and have allocated resources to, the motivation or emotional well-being of military personnel. Senior leaders would like the commitment, morale, and overall "taste" for the military life to be high among their personnel. This desire reflects the recognition that unit readiness can suffer if unit personnel are not motivated to provide the effort needed to use their skills and knowledge effectively.

While quantitative measures of the attributes of availability, qualification, experience, and stability are attainable, there is no obvious objective measure of an individual's motivation or of its unit counterpart, morale or esprit de corps. Motivation is intangible, and the same set of "conditions" can result in different motivation levels for different people. Conditions that affect motivation typically fall under morale, welfare, and recreation or "quality of life" issues and include both individual (e.g., compensation) and family (e.g., housing) concerns. The health of individuals, the health care provided, housing options and conditions, and the availability and cost of child care are just some of the major contributors to motivation.

To summarize briefly, our research suggests that five attributes—available, qualified, experienced, stable, and motivated—are necessary and sufficient for measuring and predicting personnel readiness. These attributes are inputs for determining unit readiness. However, these five attributes themselves are influenced by inputs. The inputs to attributes are the Service and OSD activities that begin

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6Our initial survey of models used to manage personnel readiness issues included no models that specifically addressed motivational aspects. This is not to suggest that such models do not exist, only that there are few that are readily available and widely used. This is not unexpected; motivation has been a concern only in the past five to ten years. Motivational issues and the effect of motivation on personnel readiness is a fertile area for analysis, and we expect that more efforts will be devoted to building relationships in this area. See Charlotte H. Campbell et al., A Model of Family Factors and Individual and Unit Readiness: Literature Review and Elyse W. Kerce, Quality of Life in the U.S. Marine Corps.
VARIous ACTIVITIES AFFECT PERSONNEL READINESS ATTRIBUTES

In many ways, personnel readiness is more difficult to measure and predict than materiel readiness because it depends on the behaviors and choices of individuals. These behaviors and choices are influenced by both Service policies and procedures and by variables external to the military, such as the civilian unemployment and wage rates. Because of the complexity associated with the behaviors of individuals, the Services closely manage such personnel functional activities such as recruiting and retention.

Each of these functional activities has goals that relate to the goals of the personnel readiness attributes. For example, the Services have monthly recruiting objectives for the number and type of new accessions. Likewise, the Services have retention goals for the number and type of personnel to be retained in the force. Promotion and training policies attempt to match the inventory of personnel to the grade and skill objectives specified in unit staffing documents.

Activity goals do not match directly with the attribute goals. Differences arise from at least two sources—the lack of sufficient resources to apply to the activities and the personal choices and behaviors of individuals. Without sufficient resources, the Services may not be able to recruit, retain, train, or promote the desired number of people. And because uncertainty surrounds the choices of individuals, there is no guarantee that, even with sufficient resources, people will join or stay in the military.

Control and Response Variables Intermingle

The Department of Defense (DoD) or the Services can affect a control variable directly; an example is the amount of and eligibility requirements for a selective reenlistment bonus (SRB). A response variable is influenced by control variables and directly affects personnel readiness attributes; an example is the number in a targeted population that might reenlist.
In our framework, we believe the functional activities have both response variables and control variables. This relationship is shown in Figure 2.2. The response variables are what the activities are trying to achieve. Examples include the number of people, by type, who enlist in a military service and the number of people who decide to stay in the force. The response variables cannot be directly controlled by the Services because of the influence of individual behaviors. The Service personnel activities attempt to match the response variables with their goals. That is, given that the recruiting commands have a target number of accessions, the outcomes of the response variables influence how closely actual accessions will come to the targets.

As mentioned, functional activities cannot directly determine the values for the response variables. They use control variables to influence personal behaviors, which in turn affect the response variables. That is, the personnel activities use the measures the Services can control to shape the measures they cannot. For example, recruiting commands will put more money into advertising (a control variable) in an attempt to increase the number of high-quality accessions (a response variable). In turn, the number and quality mix of accessions will influence the availability of unit personnel (an attribute). The control variables are what require resources.

![Figure 2.2—The Relationship Between Attributes and Variables](image-url)
Relating Resources to Personnel Readiness

Readiness Metrics

Some readiness-related research efforts that have focused on identifying appropriate readiness measures have produced extensive lists of metrics that relate to readiness. From our perspective, these measures become confusing because they span the control variables, response variables, and attributes of personnel readiness. Figure 2.3 maps one recently proposed set of measures into our framework for personnel readiness.7

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7These measures are a combination of those proposed by the Logistics Management Institute, a federally funded research and development center, as part of an OSD research project, and subsequent OSD analysis of beneficial readiness measures.
Some useful measures of external variables, control variables, response variables, or attributes are not now included. For example, grade strength and trained (military occupational specialty, MOS) strength seem to be useful measures of the “qualified” attribute. In a similar vein, budgeted grades seem to be a useful control variable as does level of advertising, number of recruiters, level of college fund, amount of enlistment and reenlistment bonuses, end strength, and basic pay. One should assess the set of metrics in terms of being complete (no important ones are omitted), unique, and operable (have sufficient definition and meaning).

**INITIAL INVENTORY OF PERSONNEL MODELS**

The relationships among the control variables, response variables, and personnel readiness attributes are complex and not easily understood. The functional activities use a range of different types of models to help understand these relationships and to decide how many resources of what types are needed to influence the readiness attributes.

The next step in the research was to identify the models used by OSD and the Services to help manage the various functional activities. An initial inventory of these models appears in Table 2.1.

The Services and OSD use models in the personnel functional activities shown in the table columns. Strength management affects the other activities, by providing information or objectives to the recruiting and retention activities that are then used as inputs for their specific models. Strength management also includes promotion and rotation activities, areas in which the Services typically do not use models. Rather, the strength management models develop policies for personnel promotion and rotation. Finally, the comprehensive column includes models that address several functional activities.

This is an initial list because not all available models are identified. Dozens of different models used by Service organizations or contractors address various aspects of personnel management. Some of these models are large, detailed representations of various processes or of personnel behaviors. Other models are small, involving just one or two equations and directed at specific functional areas. During our interviews and literature search, we tried to identify the major
# Table 2.1
## Initial Inventory of OSD and Service Personnel Models

<table>
<thead>
<tr>
<th>Organization</th>
<th>Recruiting</th>
<th>Retention</th>
<th>Strength Management</th>
<th>Training</th>
<th>Comprehensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSD</td>
<td>Cost performance trade-off model</td>
<td>Forces, Readiness and Manpower Information System</td>
<td></td>
<td>Compensation, Accessions, and Personnel Management Model (CAPM)</td>
<td></td>
</tr>
<tr>
<td>Army</td>
<td>FAARRS-SHARE GRC-SRB Model</td>
<td>ELIM MOSLS OPALS Barron TTHS</td>
<td>Army Training Requirements and Resources System (ATTRS) BLTM</td>
<td>Status Projection System (SPS) Army Flow Model AMCOS</td>
<td></td>
</tr>
<tr>
<td>Navy</td>
<td>Production Resource Optimization Model</td>
<td>ACOL Bonus Reenlistment Model</td>
<td>Enlisted Cohort Model (ECO) Navy Training Reservations System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Force</td>
<td>Career Job Reservation Model (CJR)</td>
<td>Total Officer Personnel Projection System (AFTOPPS)</td>
<td>Related Management Decision Support System (RDSS)</td>
<td>Long-Term Readiness Assessment (ULTRA) Sable</td>
<td></td>
</tr>
<tr>
<td>Marine Corps</td>
<td>Marine Corps Total Force System</td>
<td>Enlisted Personnel Model</td>
<td>TRAMS Recruit Distribution Model</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**
- GRC = General Research Corporation
- ACOL = Annualized Cost of Leaving
- OPUS = Officer Planning Utility System
- FAARRS-SHARE = Forecasting and Allocation of Army Recruiting Resources System–Sequential Hierarchical Allocation of Resource Elements
- BLTM = Battalion-Level Training Model
- TRAMS = Training Management System
- AMCOS = Army Manpower Cost System
- RB = Selective Reenlistment Bonus
models commonly used. The absence of a model in a particular cell in Table 2.1 should not be interpreted to imply that no models exist for that Service in that functional area, only that we did not identify any models in our initial survey. Also, in some cells we may have identified only a subset of the models used by the Services or OSD.

From this list, we made an initial decision to examine the ELIM and MOSLS models used by the Army for strength management. Strength management was chosen as a functional activity since it deals with the whole force and, therefore, has large resource implications. Strength management is also often the focal point for other functional activities. For example, in the Army, ELIM and MOSLS produce recruiting goals and reflect the anticipated outcomes of retention and promotion policies.

The Army was chosen for a number of reasons. It is the largest Service in terms of personnel strength, and its models have a long history of use (and modification).8

With this choice for the initial examination of how personnel models work, how well they work, and how they could be useful in the resources-to-readiness relationship, we next turn to an overview of Army strength management and the role ELIM and MOSLS play.

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8In addition, RAND’s Arroyo Center had a body of knowledge that could provide initial insights into ELIM and MOSLS.