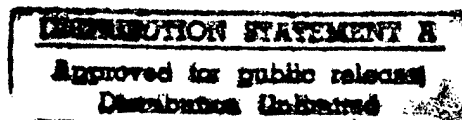


**Sex Differences,
Stress,
and
Military Readiness**



March, 1996

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Sex Differences, Stress, and Readiness

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“Women, are they? We wish it were so. We never had truer friends or more valiant companions.”

Jacob and Wilhelm Grimm
The Four Gallant Sisters

“I am eager to go and fight our enemies. I am not afraid. I will show them that my courage is as great as any warrior’s!”

Pohaha, Tewa maiden warrior
Pohaha
Robert D. Sans Souci (Reteller)

Foreword

Women are entering military service in record numbers. In 1995, there were nearly 200,000 women on active duty in the U.S. armed forces. Given the proportion of incoming recruits who are women, it is expected that they soon will comprise 20% of the force. It is not clear whether current leadership strategies and logistic support will continue to be effective, in view of this emerging demographic. The battlefield for which all troops--women and men--are preparing is a rapidly evolving and highly uncertain one. Changes in the political and technological forces that shape this battlefield suggest that commanders will need to revise existing models in order to accomplish the missions of the 21st century.

To develop a fully effective force, it is incumbent upon the military to provide leadership and logistic support that elicits effective performance from all of its members. Thus, the incorporation of women into the force may require changes in the structure of the armed forces, including changes in the "image of soldier" to which leaders are responding, and in the logistic support provided to the troops. The development and maintenance of an effective force requires a comprehensive understanding of individual differences in capacity, in resilience, and in vulnerability, as well as an understanding of how those differences interact with environmental factors to affect health and performance.

The goal of this project was, therefore, to consider the effects on military women's health and performance of the stress associated with combat, deployment, contingency operations, and trauma. The component of that effort represented in this volume sought (1) to review empirical and theoretical work bearing on issues of sex differences¹ in the effects of stress on mental health and performance, and (2) to consider ways in which knowledge of this work might assist commanders in the integration of women into an effective military force. It is our hope that this material will prove useful in the development of a structure within which active duty women and men can function effectively. The success of this effort in the military, for which readiness is the singular operating principle, may also provide a model for change in civilian society.

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¹The American Psychological Association (APA) provides guidelines for the use of the terms *sex* and *gender*. "*Gender* is cultural and is the term to use when referring to men and women as social groups. *Sex* is biological; [it is to be used] when the biological distinction is predominant" (APA, *Publication Manual of the American Psychological Association*, 1995, p. 47). Reflecting differences in the interpretation of these guidelines by chapter authors, readers may find variability in the usage of these terms in this volume.

Preface

Battlefield Ecology in the 21st Century: Situation, Mission, Execution

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The opinions and assertions herein are those of the author and are not to be construed as reflecting the views of the Uniformed Services University of the Health Sciences or the U.S. Department of Defense.

As we begin our discussion of stress and women's health during combat, deployment, contingency operations, and trauma, I will provide some perspectives on the 21st-century battlefield. From the perspective of a professional military officer, I will consider the fundamental elements of situation, mission, and execution. As an epidemiologist, I will also employ the classic paradigm of agent, host, and environment in an attempt to provide a near term and future battlefield context for our discussion.

	Agent	Host	Environment
Situation			
Mission			
Execution			

Figure 1. *The analysis matrix for battlefield ecology.*

First, the **agents** on the battlefield will include not only the weapon systems, but also the command, control and communication and intelligence gathering apparatus. Conventional munitions, directed energy, chemical and biological warfare agents all will be present, as will the weapons of terrorism and psychological operations.

Host considerations focus on men and women in the military and equally on the military units in which they serve. The interaction between individual and unit is fundamental to understanding behavior on any battlefield. As the characteristics of military units change--much smaller, more readily mobile, increased lethality in weapon systems, expanded requirements for independent action due to wide dispersion required for survival--so will the influence of the unit on the behavior and performance of its members.

The battlefield **environment** is perhaps the most difficult issue to address. Perhaps least likely is a set piece battle in the desert such as Operation Desert Storm where allied forces had time for uncontested deployment and force buildup in friendly territory, using port facilities and other infrastructure developed over 50 years. They then trained, planned, and executed an uncontested air campaign to take out the enemy command, control, communication and intelligence systems before executing a model encirclement attack relying on rapid maneuver and "one shot--one-kill" weapons systems to quickly subdue the enemy. We will never fight Desert Storm again. Future military encounters are more likely to resemble Operation Just Cause in Panama and recent operations in Somalia, Haiti, and the former Yugoslavia. In each case the environment is uncertain and difficult to label or characterize.

Future war is seen by some writers as more than the next evolutionary step in military development. We have reached a point where rapid maneuvers have replaced frontal attacks. The focus is on encirclement and the enemy flanks and rear, employing a

wide range of weapons within flexible combat formations led by commanders under mission orders which permit considerable autonomy in achieving the Commander's intentions. In the next generation of warfare, the focus of tactics and strategy may be the enemy population's support of its government. Military forces may be avoided entirely, similar to the approach currently employed by terrorists. Equally likely is the advent of intelligence gathering and strike systems of such power and precision that all military bases or troop concentrations will be highly vulnerable over extreme distances. This will lead to small but enormously powerfully armed military formations (a platoon of 40 persons may have the destructive power of a current brigade of 7500 troops) moving rapidly over large areas, conducting reconnaissance and strike missions, with infrequent logistic support and contact with the parent unit.

To a military staff, *situation*, *mission*, and *execution* translate to: what is going on; what do we want to do about it; how will we do it. Beginning with *situation*, there is some agreement that our military forces will be smaller, employing a broad array of high technology systems ("Digital Battlefield") to offset small force size. The United States must remain a maritime power with free access to various markets and resources, and the ability to project power abroad in the national interest. Thus air, land, and sea expeditionary forces are necessary. Simultaneously, the military may be more heavily involved in countering new threats such as international drug cartels and transnational fundamentalist terrorism, both at home and abroad.

In addition, we are witnessing the dispersion of mid-range ballistic missile technology around the globe, along with burgeoning capabilities to produce chemical and biological weapons, and remotely piloted vehicles (RPV) for intelligence gathering. The acquisition of these and other improved sensors and high lethality weapons systems by many countries suggests that the future situation will be considerably more dangerous whether facing other military forces or terrorists.

There is no agreement on what the paramount *mission* will be in the 21st century. Current U.S. policy requires the capability to fight and win two medium-intensity regional conflicts, presumably modeled on Desert Storm, simultaneously--a task presently unattainable. The military operational continuum or "Spectrum of Conflict" moves from highly probable low-intensity conflict (now called "Operations Other than War" (OOTW) through overt operations between two military forces, and ultimately the high-intensity theater nuclear war.

Operation Desert Shield fits the mid-intensity portion of the spectrum while operations such as "Operation Just Cause" in Panama, humanitarian assistance in Somalia, intervention to rescue civilian governments in Haiti, and peacekeeping (implementing a treaty in the former Yugoslavia) are all examples of OOTW. Given the increasing U.S. intolerance for any military operation producing casualties, OOTW may well be the predominant form of military operation, while some capability to deal with warfare between the Koreas, or mainland China and Taiwan will be maintained.

In response to questions about *execution*--how will our military do these things--conditions of enormous uncertainty and confusion are likely and current paradigms will

have limited application. In the film "Aliens Two," a U.S. Marine platoon (22 troops and officers) with firepower, sensing, and communications capabilities exceeding that of a current brigade is dispatched to an enormous space station to recover it from alien invaders. One third of the platoon is women--they take the "point" positions and handle the most potent weaponry. The platoon can afford very few losses of personnel due to the high technology systems and operator proficiency requirements. Their unique capabilities also define their vulnerability. And there is no longer a parent unit nearby that is able to support, sustain, and replenish them. This may also characterize 21st-century battlefields.

Small unit isolation and vulnerability will be exacerbated by the enormous amounts of information that will bombard not only officers and NCO's, but also individual troops. Land Warrior 21--a U.S. Army concept--provides each troop with a spacesuit-like uniform offering some ballistic protection, chemical and biological agent protection, macro-climate cooling/warming, intrasquad voice communication, integrated computer global positioning system (GPS) with digital maps and overlays, and a built-in gateway to high tech command, control, and communication systems. The helmet will have infrared night vision and laser-sighting devices. The face plate of the helmet will have multiple "heads up" displays providing information on the location of other unit members, alerts for enemy presence or hostile weapon system "lock on", and physiological data for self-monitoring. The benefits of these systems may well be offset by producing sensory overload, and contributing to the frequent battlefield experiences of ambiguity, uncertainty, isolation, anxiety, and fear.

Ultimately, we must wonder if the battlefield for which we are preparing is the one we are most likely to see. Will there be opponents who will oblige us by playing by our rules, when we have the better weapon systems and training, as in Desert Storm? Would it not make more sense for potential adversaries to adopt methods, tactics, and systems against which our capabilities would be greatly reduced?

In brief, then, it is this highly uncertain battlefield ecology that must provide a major element of the context for these discussions. The service members--female and male--and the units in which they serve will succeed or fail, survive or die, in consequence of their ability to function in this ecology.

I

Defining the Issues

Sex Differences, Stress, and Readiness

**Integration of Women Into the Military:
The Challenge of Effective Utilization**

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Integration of Women Into the Military

Deployments and contingency operations comprise the primary tasks of the military forces. Because these operations expose people to ultimate risk, that is, to effective life-ending trauma or loss of life, we need to understand all aspects of total force support. That support must exist in the leadership, as well as in the logistics, provided to the force. Combat doctrines must be conceptualized in such a way that they can be utilized effectively by the force to guide their actions.

The challenge, then, is to understand fully the implications for total force support of integrating women--half of the population, half the human resources of the United States--into the military forces. Women now comprise a substantial, and relatively new, segment of those forces. Understanding this population is an essential element of appropriate planning and preparation for the future. To provide support, logistics, and effective leadership for the total force, and to maximize the availability of the total force, we must understand every component of that force. Questions about stress and women's health and performance flow directly from this broader issue. It is crucial to examine how the integration of women affects the structure that provides force support.

A Utilitarian Logic

The questions on which leaders must remain focused are (1) how does one compose the force for maximal performance effectiveness? and (2) how does one maintain that force so that effectiveness can be available over the time span required by the mission?

This utilitarian logic is not without inherent problems. In composing a maximally effective force, the institution is faced with difficult ethical issues. It was obvious to General Sherman, for example, in preparing for the march from Atlanta to Savannah, that since he was operating with open flanks, the very speed of his movement would be a critical contributor to his overall effectiveness. There could be no restraint on the rapid movement of his troops.

The first thing he did, therefore, was to review his troops and exclude those who showed any signs of illness or weakness. In so doing, however, Sherman must have selected out soldiers who might have performed well, and soldiers who felt some psychological injury--stress if you will--as a result of having been told by their commanding general, suddenly, that they were no longer needed. The utilitarian logic that guided Sherman did not, and still does not, accommodate these concerns. This logic is not particularly edifying in its consequences. The great leaders inevitably stay focused on the overall issues that have to do with command, structure, and the function they are fulfilling. They are not the great humanitarians.

Because selection of troops is a matter of judgement, it is important not to prejudice that judgement. It is very easy to make exclusions based on demographic characteristics. In examining the likelihood of illness, and the likelihood of stress, it is all too easy to focus on a specific demographic group, rather than a group defined on the basis of performance. General Sherman was focused on an outcome, and, accordingly, considered only those variables related to the accomplishment of that outcome. He excluded soldiers who were

ill. He did not exclude short or tall soldiers, soldiers from Maine or Ohio, or those of Germanic or Native American origin. Variables not related to the functional outcome were not considered.

Integration of New Populations

There is nothing new about the process of integrating a new population into the U.S. military. This reevaluation has occurred each time the fundamental demographic of the military has changed. The most memorable instance is the bringing of African American soldiers into the force in 1863. Prior to that, with the acquisition of the Louisiana Purchase, the military acquired regiments of free men of color. These regiments were a standard part of the raised militia and army for New Orleans, as well as part of the force that fought in the War of 1812.

Also the U.S. military frequently has served as a primary integrative force for new immigrants. There were units in the Civil War in which German was the common language of the day. If you have a unit that speaks primarily German, for example, you need German-speaking leaders-- the structure needs to be modified if one expects to elicit maximum performance from these soldiers.

The recruitment of Seminole Apache scouts into the frontier armies that existed during the period from 1865 through the closing of the frontier in 1890, and until the early 1900's, provides another example of the incorporation of a new group into the U.S. military. The south was successful in recruiting a portion of its armies from the Cherokee, Creek, Choctaw, Seminole, and Chickasaw populations. Native Americans performed an essential function in that army; their integration, in fact, perhaps comprises one of the most outstanding examples of military effectiveness. Reflecting this demographic, the one non-white general for the Civil War, Stan Marley, a Cherokee general who fought at the Battle of Pea Ridge, was in the Confederate army.

At each of these historical junctures, the question has been, how do we integrate a new group into an existing structure? In each of these cases, adaptations have occurred and leadership has evolved.

Image of a Soldier

As women arrive in the service, they are confronted with the image in the mind of their leader. And the image in the mind of the leader is too frequently an image that evolved throughout that leader's youth and early middle age. The "culturing" experience of youth and young adulthood is very important. Out of this experience emerges the leader's conception of whom he leads.

In many interviews conducted during the middle phase of the Vietnamese War, officers revealed their picture of the soldiers as strapping young farm boys. In fact, most of the soldiers in their units were urban youth. Many of these officers, in their late 40's

and 50's, could think back to World War II, perhaps even to the Korean War, when a fair portion of their units were, in fact, rural, particularly those that came out of the midwestern states and out of the National Guard units.

The image they bring to a mission is frequently the image formed when they were last a company commander, a platoon leader. This means that one of the things with which leadership is confronted is how to become leaders of women as an integrated part of the force, and how women will be incorporated into the image of the force that leaders carry. In 1974, when women were first deployed to Europe, officers' wives were the most commonly cited source of information about the behavior of women in the command of those officers. Most of these wives had made the decision to marry an officer and not to join the military. It is likely, then, that they were unable to enlighten the officers about the military women they sought to understand.

Thus, one of the fundamental tasks is to change internal reference points--to modify the image of the soldier carried by leaders. That task is a prerequisite to change in the structure of the military. The evolution of these internal reference points must keep pace with a changing force, in order to provide guideposts for developing an environment that will allow that force to be effective. That modified structure should provide effective leadership, effective logistics, and effective planning that incorporates the new group it is now serving.

Some of the most effective units of our combat arms in the army of the frontier, were our elite Black units. In contrast, at that time, the quality of the White units was exceedingly poor, with a third or more of the troops AWOL at any one time, and with very high rates of alcoholism. Neither of these problems existed within the Black units. The rate of alcoholism among Black soldiers was less, by nearly an order of magnitude, than that in White soldiers.

This pattern persisted from the 1870s through the Spanish American War. Although the African American divisions that fought for the French army fought brilliantly, the development of the racist philosophies and social Darwinism of the early part of the twentieth century put soldiers of color in an ever-more-difficult position. The judgement of generals coming out of World War I was that the Black units fought poorly. There is, however, no evidence of a deficiency in performance, and that judgement has long been dismissed by military historians.

Nevertheless, the belief persists that the Black soldier is unable to perform. The image of the Anglo-Saxon as a leader and a combat leader has become the predominant image. In World War II, Blacks were excluded from combat ranks, thereby harming our entire capacity for raising an army. Black troops were deployed literally out of the kitchen to save our military position. In the Battle of the Bulge, for example, it was discovered suddenly that Black soldiers indeed could fight brilliantly. In the integrated army of Korea and since that time, Black soldiers have demonstrated their capacities countless times.

These were Black troops, rather than Black soldiers within units or troops. They were all segregated, as we never had an unsegregated army until Korea. Only then did the

Black soldier show his outstanding performance, because until that time we only had Black troops. It was said that the Black troops performed poorly. Only Whites were allowed to command them, however, and it is interesting that we did not attribute poor performance, when it existed, to failures of the White leadership. Conversely, Blackjack Pershing earned his name because he largely commanded African American troops. The fact that his troops performed well was attributed to him, not to their guts, blood and bone, and brains.

Notice that, because of the image of the Black soldier being carried between World War II and the Korean War, the tendency was to make attributions, not on the basis of performance, but on the basis of a demographic trait. When a group can be distinguished on the basis of physiognomy and appearance, this tendency is strong, and leads to easy, sloppy thinking within the military realm.

Frequently, characteristics attributed to demographic groups reflect instead characteristics of the environment into which those individuals are being placed, or algorithms used to recruit and select soldiers from the general population. These characteristics do not describe a general population that exists in an unvarying environment. It is striking that, for an African American male serving in the U.S. Army, the chances of dying violently are exactly the same as those of a White male serving in the army, and radically lower than the chances of dying violently in the civilian world. The violence rate for Blacks in the military is approximately 500 percent lower than it is for Blacks in the civilian environment. Is this a function of the differences in the characteristics of the Blacks who enter the military versus those who do not, or is there something protective about the military environment?

These (African American military personnel and African American civilians) are neither the same populations, nor do they exist in the same environment. The relevant components of the military environment are clear. First, and perhaps foremost, by definition, everyone in the military is employed. Second, the military practices stringent gun control. Third, the military comprises a structured society in which there is an expected equivalency of its members. Finally, there is support for the family, including universal health care and drug treatment programs. These aspects of the environment operate on individuals who elected to enlist in military service.

The delicacy of the constitution of women when exposed to extreme stress is frequently emphasized. A vision of the family persists in which the mother is at home, taking care of light tasks, looking after the children to whom she devotes most of her time. She is cared for by a male who is, if silent and uncommunicative, nonetheless a "wonderful provider." Though sometimes considered a traditional vision of the family, it is at best a 19th-century White middle-class vision of the family, and even then representative only of a very narrow sociodemographic group. Most of 19th-century America comprised a farming community characterized by a labor intensive lifestyle. The farm wife did heavy work. The farm male did heavy work. The children worked also, and received scant attention. Moreover, the role of women, as well as that of men, has evolved in a highly unstable technologic environment, and in a very diverse country. If these images from the past ever were valid, there is little basis for assuming they will continue to be so.

The astronaut corps provides another example of a persistent image that potentially interferes with the evaluation of soldiers. If one were to predict, on the basis of gender, the performance capacity of women in the astronaut corps, those predictions would be inaccurate. Moreover, women in the astronaut corps are three standard deviations distant from *any other population* in the way they have prepared for their mission responsibilities.

In the mid-1970s came the drug epidemic. Hepatitis became prevalent as a result of widespread use of IV drugs by military personnel. Military women did not use drugs. The hepatitis epidemic occurred, therefore, in men, not in women. Women comprised a group that was relatively immune to a disease that was disabling the rest of the troops.

The image of "soldier" can become outdated; so, too, can images of the environment in which soldiers are called upon to perform. It is certainly true, for example, that, because of the way ground combat has been carried out, the lack of upper shoulder strength has been one of the factors underlying the exclusion of women from the military. The parameters of combat have changed, however, and we are now confronted with a new set of issues (Llewellyn, this volume). In evaluating these images, it is also important to ask to what extent they are based on average differences between groups, and to what extent they deny individual differences within populations. Women may not be able to put in a top lug bolt on a tank recover; neither, however, will 80 percent of men be able to do so.

The lug bolt example also underscores the importance of training, and of evaluating not an innate ability to perform a task, but the ability to be trained to carry out a task. Whether or not an individual has the capacity to be *trained* for a particular mission is not something that can be determined from a simple algorithm--on the basis of either a simple demographic characteristic or a long-standing image. The concern is not how we came to these images. If we are going to adapt as a nation, these images cannot be retained. Leaders must operate with concepts that make them effective in this environment.

Sex Differences and Military Readiness: Modifying the Structure

To the extent that this search reveals sex differences, based on empirical data as opposed to myths that people have been quoting for a long time, the environment or the military structure must be changed to accommodate those differences. One cannot simply pretend differences are nonexistent. Nor can one decree that there will be no differences--that women must perform to their maximum capacity in an environment that is not structured to facilitate that. It is like sailing in the ocean. You can complain forever about the wind; but if you are sailing, you sail the direction you want by understanding the direction the wind is blowing, not by decreeing it.

What is the most respected quality in a soldier? It is capacity--the capacity to fly, to drive, to handle the weapons. The lesson that must be extracted from the data reviewed in these volumes, therefore, is how to exploit the strengths of individuals by modifying the structure within which those individuals operate. The equipment, the training, the logistic support, and the leadership--it is the responsibility of the institution to prepare soldiers for those assignments.

Integration of Women Into the Military

A Military Woman's Journal

Integration of Women Into The Military: One Woman's Journal

Evelyn P. Foote, BG, USA (Ret.)

I am a soldier who happens to be a woman. My credentials to write about military women, especially Army women, are anchored in nearly 30 years of service in the United States Army. The three decades in which I served, from early 1960 to late 1989, were decades of great social ferment and turbulence. In those 30 years, the fabric of our society was shredded, then rewoven, into startling new forms and patterns. Along that thorny path of changing times, something we thought impossible to happen did happen: We lost a war: the war in Vietnam.

That my military career spanned these particular decades is more an accident of timing than it is a product of astute planning. It just happened that way. Let me explain.

I never intended to have an Army career. In fact, I avoided recruiters who visited our campus during my undergraduate years at Wake Forest University. Whenever I found service brochures in my mailbox, I threw them away, unread. My concept of life as a military woman was negative, to say the least. I had heard the derogatory comments of many of the World War II veterans on campus about the caliber of women who joined the Army. Actually, few of these veterans had either met or served with military women. Their comments were based on rumor, not facts. Further, I was sure that no military man or woman was given the opportunity to speak for themselves, use imagination in solving problems or show their initiative in other ways. I just knew that military life meant taking orders and keeping your mouth shut at all times. That was not my idea of a satisfactory career.

I graduated in 1953 with a bachelor of arts degree in sociology and an overly optimistic opinion about the power of that degree to get me an exciting job back home in Washington, D.C.. The agencies with whom I interviewed were more interested in my secretarial skills than in the content of my college education. Consequently, I ruled out such agencies and applied to again work with the Federal Bureau of Investigation (FBI), the fiefdom of J. Edgar Hoover. I had previously worked with the FBI in 1947-48 and 1950-51 to earn money for my college education.

While the FBI was doing its background check on me, I worked as a super market cashier, one of the two job skills I had acquired in college (being a waitress was the other). When accepted by the Bureau, I returned to that agency as a GS-4 (General Services) clerk in the Internal Security Division. During the year and a half with the FBI, I attended secretarial school at night to learn typing and shorthand. These were skills I wanted for my own use, not to improve my job prospects.

The FBI was the first in a series of places I worked in the 1953-1959 timeframe. I resigned from the Bureau to work as a copy girl at The Washington Daily News, one of the three leading newspapers in Washington in those years. Then, I became the director of public relations and advertising for the Gray Line Sightseeing Corporation but stayed with that firm only seven months. My final employer during this "job gypsy" phase of my life was Group Hospitalization, Inc., Washington's Blue Cross/Blue Shield hospital insurance agency.

With the exception of the Gray Line Corporation, I left each of these employers for the same reason. I was disillusioned and under-utilized. Wherever I worked, the "glass ceiling" seemed to be down around my knees. For example, the women who worked for the FBI were file clerks, secretaries or typists. Some few were supervisors of clerks or of typing pools but none were special agents or division chiefs. A woman FBI agent? Not in those days.

I took a considerable pay cut in going to work for the newspaper as a copygirl. The Washington Daily News, part of the Scripps-Howard newspaper chain, was home base for the great war correspondent, Ernie Pyle. During World War II, Pyle was beloved by all for his columns concerning the everyday life of the American GI. He himself was killed by a sniper while reporting from the Pacific theater of war. I often sat at his battered old desk, running a finger lightly over the small bronze plaque which bore his name. It was a good place to rest when not running copy between the editors and the pressroom, or going out for coffee for reporters. It was also a good place to day dream of my own byline stories and of the day I, too, would be a reporter.

In my free time, I produced more than 20 articles which appeared under my byline in the paper. After about a year, the city editor did offer me a staff reporting job, but only to write about foods and fashion. These were the last subjects I wanted to cover. Local or national news, the courts, human interest stories; or sports: I would be happy with any of these subjects. Such assignments, however, were usually given to male reporters. Since I could see no real future with the Daily News, I resigned and took the position with the Gray Line Corporation.

All of the executive positions with Gray Line were "one deep" in the 1950s. In my job, I was the one who prepared all news releases, wrote and designed tour brochures, took special groups on trips and handled the advertising account for the firm. There was no one for back up, no assistance in typing, filing or handling the telephone. Had I enjoyed this work, I would have happily shouldered the many tasks and marched on without complaint. But, I hated the work and viewed myself as nothing more than a glorified huckster. This was definitely not my cup of tea. Once again, I cleared out my desk and left for what I was certain would be greener pastures.

Of course, the new pasture--Group Hospitalization, Inc.--had its own patches of crab grass. I began my employment as one of the "girls" in the subscriber service office, answering questions and solving problems for clients. Then, I was promoted to be the enrollment secretary in the enrollment department, which actually was the sales department. I supervised the clerks, played girl Friday for the sales manager and ran staff interference for the 18 men who were the corporation's elite employees: the salesmen.

I stayed in this position for about two and a half years. The work environment, the pay and benefits were pretty good, but I knew that this was not where I wanted to plant my career flag. Once again, I found myself tripping over the glass ceiling. I could literally run the enrollment department, but I could not be the manager or one of the salesmen. That was strictly "male only" turf. So were all corporate executive and department head positions.

It was during this time that I met my first woman Army officer, a captain in the Adjutant General Corps who was serving on the Department of the Army (DA) staff in 1959. She and I just happened to attend the same picnic one summer day. Her name was Julia E. Ledbetter. She had been a member of the Women's Air Service Pilots (WASP) in the Second World War, a courageous group if there ever was one. These women ferried combat aircraft from plants to air fields all over the country, towed aerial targets in gunnery practice and taught men in the air corps how to fly. A number of the WASPs were killed in performing these duties. When I met Captain Ledbetter, she was the only woman in the Army who wore aviator wings. She held that distinction until 1973 when Army women began training to fly.

At the time we met, I had already begun to investigate overseas employment opportunities with a number of agencies. In fact, I had submitted my application to the U. S. Information Agency (USIA) for a foreign service officer position. I asked the captain if she knew anything about Army civilian jobs overseas. She did not, but she said she would obtain such information from her civilian personnel office and send it to me.

She was true to her word. In a matter of days, a large package arrived in the mail, containing a lot of information about civilian job opportunities overseas. The package also contained one other brochure: a recruiting booklet which described in glowing terms officer career opportunities in the Women's Army Corps (WAC). The title of this particular booklet is embedded in my memory: "Executives Wanted."

While all of the information was interesting, I was especially drawn to the WAC officer booklet. One sentence in the text captivated my attention: "WAC officers do not type!" I was also intrigued at the thought of being commissioned a first lieutenant because of my age (29) and supervisory experience. What truly riveted my attention was the fact that the basic salary and allowances for a single male and female lieutenant were identical. This was a first in my professional experience. Although a lieutenant's pay was miserably low in those days, it was equally miserable for both men and women. Then there were the opportunities for travel, graduate education, 30 days of paid leave each year, leadership training, and, oh yes, the chance to retire with excellent benefits after 20 years of active military service (not that I would ever stay in that long).

To make a long story short, I applied for the commission. Captain Ledbetter was very helpful in setting up interviews and medical appointments, and in completing the voluminous paper work. She patiently answered my questions about her career, her travels, the courses she had taken in the Army, the type of training I would receive, some of the possible assignments I might be given after officer basic training, and so forth.

The letter offering me an appointment as a first lieutenant came in November 1959. I accepted the appointment with its two-year service obligation and, on December 15th, was sworn in. My parents and Captain Ledbetter were there to see me take this initial step into an uncertain future.

I began my Army career later in life than most lieutenants. My pipedreams of being successful in the civilian worlds of business and government had been dampened but not extinguished. After more than seven years of trench warfare in the workforce, I was older, somewhat wiser through experience, and definitely ready to try a new professional direction. That this new direction would be found in the Army was as much a surprise to me as it was to friends and family.

This brings me to the beginning of that two years of service and what I initially thought would be a brief, but interesting interlude in my life. Before talking about assignments or relating any "war stories", however, I need to tell you something about the Women's Army Corps and how it was organized.

The Women's Army Corps

The Army I joined in 1959 was far different from the Army in 1996. My choice of branches or corps was limited to one: the Women's Army Corps. The only other source of commissions for women was the Army Medical Department, provided they had the requisite professional medical education and experience. Even women lawyers, licensed to practice law or to plead cases before the Supreme Court, received their commission in the WAC. While much of their time was spent on detail to the Judge Advocate General Corps, they also had to perform their share of WAC duty.

The WAC was almost 18 years old when I reported to Fort McClellan, Alabama to begin my training. The Corps had survived the difficult growing pains of its early years, when everything done was a first time experience. It had overcome the disadvantages of being first established as an auxiliary corps in 1942 whose members had no official military status and did not enjoy the same rank, pay and benefits that Army men received. Additional legislation passed by a reluctant Congress in June 1943 and signed into law on July first of that year gave the WAC the status which meant that its members would be fully entitled soldiers, serving in, not with, the Army.

The WAC also survived the original plan embedded in law which called for its total demobilization no more than six months after the official end of World War II. Its own senior leaders were marching the Corps straight toward demobilization. That would have happened in May 1946 except for one thing: General Dwight D. Eisenhower, who led the allied forces to victory in Europe, was named the new Army Chief of Staff in November 1945. He placed a hold on the scheduled demise of the WAC and ordered the Army staff to develop a plan calling for the retention of the Corps in the postwar Army. Thus began a period of uncertainty for the WAC as well as for women serving in other branches of the armed forces. Their military future was equally unclear.

With all of the armed forces working to retain their female components (the Marines with great reluctance initially), the essential legislation to make this happen was hammered into shape and passed by Congress on June 2, 1948. The Army's part in the process was energized by the presence of a new Director of the WAC who enthusiastically supported a permanent role for the Corps. She was Colonel Mary A. Hallaren, the "Little Colonel," as

she was fondly called by members of the Corps. The Women's Armed Services Act of 1948, signed into law by President Truman on June 12th, ended the debate over the continued presence of women in the postwar force. The women were here to stay, for limited utilization and in small numbers.

Just as an aside, Colonel Hallaren--a tiny, dynamic octogenarian with a true command voice and presence--continues in 1996 to be an ardent supporter and spokesperson for all women in uniform. She has been my own role model since 1960.

Mission and Structure

To understand WAC structure, you must first understand the mission given to the Corps in 1942. Stated simply, the mission was to provide a nucleus of trained Army women who, in time of mobilization, would train many more women volunteers. They then would replace men who were performing non-combat duties, thereby freeing the men to fight.

In war or peace, the mission remained the same. A WAC was either assigned to perform branch-related duty (recruiting, training, instructing or commanding women) or she was assigned to some post, camp or station to perform clerical, administrative, personnel or related duty. WACs also served in a number of medical specialties, as communicators, and in staff assignments at Army major command or at DA and joint levels. Assignments which were not branch related were called branch immaterial, or BI. In BI assignments, WACs could be utilized by just about any unit except those directly involved in combat.

Make no mistake, however: branch-related assignments were the lifeblood of the Corps. Any duties away from the Corps were viewed as temporary in nature. Duty with the Corps was considered by the WAC leadership to be the most important duty a WAC could perform.

The hierarchical organization of the Women's Army Corps constituted a "petticoat channel" within the larger Army which knew how to get things done: from influencing policy to making assignments. At the top was the Office of the Director, WAC, which was located within the Office of the Deputy Chief of Staff for Personnel at DA level. The serving director held the temporary rank of colonel during her tenure. Her position was statutory in nature, and she was charged to advise the Army chief of staff on all matters concerning the WAC.

WAC officer assignments were made by the Chief, WAC Branch, Officer Personnel Directorate, in the Office of Personnel Operations (OPO). The branch coordinated most officer assignments with the director's office. Since enlisted assignments were made on the basis of career management field or military occupational specialty, there was no WAC branch per se in the Enlisted Personnel Directorate of OPO. You can be sure, though, that assignment actions affecting enlisted women were closely monitored by the director and her staff.

At major command level throughout the Army, in the United States and overseas, WAC officers in the grade of lieutenant colonel performed the duty of WAC staff advisor (WSA). These senior women, handpicked by the director, were nominated by name to the commanders of the major commands. These positions, like that of the director, were statutory. While acting as advisors to their commanders concerning all aspects of WAC assignment and utilization, the WSAs were also in touch with WAC company commanders in their areas of operation. The problem-solving assistance and moral support they gave to the women commanders were vital.

Another key position with direct access to the director was the Chief of WAC Recruiting who served in the Army's recruiting command headquarters. In turn, she was tied into the Army-wide net of WAC recruiting officers and noncommissioned officers (NCOs). Since all WACs were volunteers, recruiting success was critical to the Corps. The director's insistence that the enlistment standards for women would be higher than the standards for men insured that quality would remain the hallmark in recruiting WACs.

WAC Center was the heart and soul of the Corps. Like all senior WAC officials, the Center commander, a lieutenant colonel, was in close touch with the director and her staff, reporting on the state of training and identifying policy problems which needed the director's personal attention. The Deputy Commandant of WAC School and the Commander of the WAC Training Battalion (WTB)--the only one of its kind in the Corps--answered to the Center commander. They, too, were lieutenant colonels.

This, then, was the WAC organization for action. It was a dynamic "old girls" network; which operated both formally and informally, impacting any policy or action when necessary which concerned the worldwide acquisition, training, and utilization of WACs. While others might command the women, it was the director's guidance and regulations which dictated how and where they would be assigned.

WAC structure also provided women officers their only opportunities to command. The same can be said for the noncommissioned officers whose only opportunities to be first sergeants or other cadre members were through assignments to WAC companies. The law which gave the Corps permanent status in the Army in 1942 (Public Law 78-110) took away the Director's command authority, leaving her the responsibility to serve only as an advisor to the Army's senior leadership. The law also made it clear that no woman officer could command men unless specifically charged to do so by the Secretary of the Army. The likelihood of this happening was nil.

This law did, however, stipulate that WACs, and only WACs, would be assigned to WAC companies. It also stated that only WAC officers would command WAC units, thus assuring the women officers some limited command opportunity. The women of the Corps had the first Director, Oveta Culp Hobby, to thank for insuring these provisions were in the law.

One final point on structure: WAC organization was unquestionably a safety net for every WAC, wherever she served. With few exceptions, WAC units were small enclaves of women serving in a far larger population of Army men. Unless male soldiers worked in

some unit or office where WACs were assigned, they were often ignorant not only of the existence of a WAC company on post, but also of the performance capability of its members and the regulations governing their assignments. As a consequence, the WAC "chain of command," from individual to company commander to WAC staff advisor to the director's office, was typically activated if, or when, the Army system failed to address or solve a problem which was specific to a WAC or her Corps. Solving that problem at the lowest possible level was the goal.

For those who wonder why there was only one colonel in the Corps, the answer is simple. It was the law of the land: the same law that set the limits on command opportunities, regular Army strength, and ranks to which women, both officer and enlisted, could aspire. The one colonel position was temporary in nature, to be held by the woman lieutenant colonel who was director, WAC. This law remained in effect until 1967.

Just think: during World War II, a woman colonel not only organized the Corps from scratch, she was responsible for its worldwide utilization. At one time during the war, WAC strength peaked at about 100,000 members who were serving at home and in all theaters of operation. I do believe that if a man had been given that responsibility, he would have worn several stars on each shoulder.

The Women's Army Corps Years

The home of the Women's Army Corps--Fort McClellan--is located in Anniston, Alabama, a small southern town situated in the foothills of the Appalachian Mountains, approximately 100 miles west of Atlanta, Georgia. The Corps had moved from its postwar home at Fort Lee, Virginia, to Fort McClellan in 1954. Also located at Fort McClellan was the US Army Chemical Corps and Training Center. Given the nature of the Chemical Corps' missions and the gender-driven organization of the WAC, these two corps were two of the most unique structures in the Army.

In February 1960, I was one of 32 women students assigned to the Officer Training Detachment (OTD), the only unit in the Army dedicated to the basic training of WAC officers. Since the Corps had no officer candidate school (OCS), the enlisted women who were candidates for commission were also trained by OTD. Successful officer candidates (OCs) received their commissions on graduation day. The rest of us--a handful of first lieutenants and a majority of second lieutenants--were fresh from civilian life. The age range for the group was 19-32.

To state the obvious, basic training for anyone is an exercise in constant stress. Certainly, there was absolutely nothing in my background to prepare me for this brave, new world. I was an older woman, on my own, earning my own way, arranging all of the details of my own life, making my own decisions. I was also used to having my own space and privacy. Space and privacy: these were not niceties for me; they were necessities.

There were moments during our 20 weeks of training when I seriously questioned not only my judgement but also my sanity. I was a volunteer who had signed on the dotted

line and agreed to forfeit my independence, space, personal time, and most human rights for the sake of enduring the pangs and arrows of strident OTD platoon officers who went out of their way to make us uniformly miserable. Our days were endless litanies of cleaning, inspections, long hours in the classroom trying to understand Army and Department of Defense organization and missions, then more cleaning and hours of study.

Much time was devoted to learning a soldier's essential skills: how, when and who to salute; rank; drill and ceremonies; how to wear the uniform, polish shoes and clean the "brass" (insignia); how to clean the cubicles we shared with one other student and the common living areas we all used, and much more. In learning all of this, the OCs were our salvation. We hung on to their every word as they demonstrated everything from spit-shining shoes to marching with a 30-inch stride.

I am convinced that making an Army brown bed is an art form. The same can be said for waxing floors and ironing shirts or skirts to the satisfaction of our superiors. Over the weeks, I found that it was a big help if you had thick skin which didn't suffer too badly from constant doses of constructive criticism. No one--but no one--ever quite measured up to the high expectations of our wrinkle free, always fastidious sterling leaders. That's just the way things were in basic training.

But graduation day did come. On that day in July 1960, 26 of us remained. Six women had been dropped for several reasons. Mental and emotional problems accounted for two; serious injury to two other women forced the postponement of their training for months. One woman was an academic failure. She was returned to service as an enlisted woman with her NCO rank restored. The sixth woman departed because she was pregnant.

To my surprise, I was named the Distinguished Military Graduate of the class despite the fact that I was too old by law to be offered the regular Army (RA) appointment normally tendered to such graduates. This didn't bother me at all, since I had no intention of serving beyond two years.

While we were still in training, the chief of WAC Branch had interviewed each of us about our initial assignments. I was even permitted to give her my wish list of things to do and places to go. First, I requested some type of staff duty far from Fort McClellan. Since location was more important to me than duty at that point, I volunteered to go to Honolulu, San Francisco or New York City to serve the Corps. The orders I later received forcefully confirmed the fact that my wish list and the needs of the Army did not mesh.

I was assigned to Company D, WAC Training Battalion, at Fort McClellan, with duty as a platoon officer. That was that. I was going to train enlisted women for the rest of my Army career. In my petulant state of mind, I was sure of just one thing: this would be my first and last assignment in the Army. No one could have convinced me otherwise in the summer of 1960.

But I was wrong. After a short leave at home, I returned to Fort McClellan, moved into bachelor officer quarters at WAC Center, and reported for duty. From the moment I was introduced to Company D's commander, Captain Betty Tucker, I liked and respected

her. With more than a decade of company command to her credit--something that is unheard of in 1996--Captain Tucker was a walking encyclopedia concerning troop duty in general and how to lead in particular. She made me feel welcome and eased some of my misgivings about taking over a platoon which was well along in training.

Let's face it: I was a green lieutenant who knew very little about enlisted training. Worse yet, the platoon sergeant knew I was a blank page when it came to leading, and so did the troops. I was their proverbial "pig in a poke", an unknown entity to deal with during their final weeks of basic training.

All things considered, we muddled through quite well. The day we met to size each other up, I was candid with the platoon sergeant about my lack of experience, readily acknowledged the true value of her experience, and charged her with the sticky task of not letting me make a fool of myself in front of the troops. In other words, I made it clear that I needed both her advice and her help to make sure that our soldiers were truly prepared to graduate and move on.

The sergeant, who had 16 years of Army service, rose to the challenge. In that first week with the platoon, I wound up being the most senior (and least knowledgeable) of three lieutenants whose platoons would be in the field for an overnight bivouac at the same time. My stress level was palpable at this point. The bivouac featured a night march in which hand and arm signals, no vocal commands, would be used. There were exercises in which the soldiers put up two-person tents and then camouflaged them, participated in an emergency medical drill, treating other soldiers who simulated terrible wounds, and as a grand finale, were attacked from the air by a pilot who dropped loud explosive devices all through the training area.

It was quite an introduction to basic training. There was one other task which had not been programmed. We had to quash the attempt by men from the Alabama National Guard to infiltrate our perimeter. The sergeants told me that such attempts by the overgrown boys of "the Dixie Division" happened quite often during the summer months.

When we marched back to the company at the end of our bivouac, the troops were tired, dirty, and in a high state of morale. So was I. We sang jody calls as we marched along and on rest breaks, the women joked about their many escapades in the field. We didn't know it then, but all of us were collecting our first "war stories," to be told many times again in the years to come, especially when WACs come together at a reunion.

As the year passed, I became more and more convinced that WAC Branch knew exactly what it was doing when it kept me at the training center. Granted, it took me some time to get used to the all-female training environment, with command and management responsibilities vested in women. That was certainly a first in my life. Sure, command authority at post level and at the Chemical Corps Training Center belonged to male colonels, but we junior officers had little to do with those people. The only time I had ever been in the Chemical Corps School was when I was a student officer. That school gave us our combat arms instruction. Since we weren't going to be assigned to combat units anyway, the instruction was just nice-to-know information to us.

Our training as officers was WAC Center business. Personally, I was very enthusiastic about the load of responsibility dumped in my lap from the very first day. My main job was to train enlisted women to be good soldiers. The women, whose ages ranged from 18 to 34, were configured in platoons of 38 women, each platoon with its own officer and NCO. In the eight-week basic training cycle, the recruits had to be transformed from civilians who were often lazy, inefficient and undisciplined into knowledgeable, proud members of the Corps. They learned about themselves and the Army in a very compressed time frame.

The competitive environment and the intense pressure to perform defeated some of the women from the very beginning. We were able to salvage a few of them through counselling and extra instruction. Some recruits were discharged without ever having the first day of training. Just being in a strange new place, forced to live in the confines of a barracks with strangers, was intolerable for them.

Despite the culture shock and olive-drab setting, most of the women learned to cope, to decipher Army lingo, to absorb a steady barrage of criticism, and to get along with the other recruits in their platoon. Those who did not were either recycled for extra weeks of training or were discharged.

That year with Company D was a defining year for me. I learned that working with troops was just about the most rewarding work I had ever performed. My superiors trusted me to train the troops well and while doing that, to make sure that their welfare and safety were top priorities for me. I also learned that the quickest way for me to gain the trust and confidence of subordinates was to show them that I knew my job, would train them well and would treat each individual with dignity and understanding, even when dispensing discipline.

I found out early in that year that making decisions concerning other peoples' lives can be a painful experience. I was the one who had to tell the company commander when a recruit just wasn't going to make the grade and that I recommended her discharge. If my commander agreed, I then had to deliver the bad news to the woman.

There is a real price to pay from "playing God" with someone's plans and future, especially when the recruit has worked so hard, but just could not meet the standard. I called the recruits who fell into this category the "would if I could but I can't" troops. You never forget them.

On the other hand, it didn't bother me much to discharge a woman who, though capable, fought all forms of authority, never cooperated with peers, and was unruly and disruptive whenever possible. We often escorted such women to the train or bus station to make sure they left town after they had been discharged. These sadly alienated souls fell into the "could if I would but I won't" category of misfits.

The extraordinary flavor of even an ordinary day as a platoon officer was enough to make me rethink my plan to leave the WAC at the end of two years. To sample Army life in some other setting, I applied to extend my service as a reserve officer for a minimum of one year, with the understanding that I would be classified as a "voluntary indefinite" officer should I remain beyond that year.

The extension was approved and orders were cut assigning me to Headquarters, Sixth U.S. Army Recruiting Headquarters in San Francisco, with duty station to be Portland, Oregon. I was going to be the WAC selection officer for the Pacific Northwest, charged with recruiting women officers from the states of Oregon, Washington and northern Idaho.

Building a Career

The first 18 months of service set the pattern for my future. I was a far different person at the end of my basic training and first year of duty than I had been upon arriving at WAC Center in February 1960. Among my many discoveries was the fact that I liked challenges and competition. Second, I also learned how much I enjoyed people work and training. Third, I realized that despite myself, I had thoroughly enjoyed my Army experiences to date and was eager to sample other places and other duties.

For the next 18 years, I would either serve in WAC assignments (except for a year in Vietnam) or be a student in an Army school. Those years prepared me to take on just about any challenge the Army might throw my way. There was an abundance of those over the years.

Take recruiting for example. The three years in Portland were an exercise in survival. Except for a three-week recruiting orientation course, the only guidance about recruiting which I received came from my superiors in San Francisco. It was "carry on." What I was to carry on remained to be seen. The slot I was filling had been vacant for months. My predecessor hated recruiting and had managed to wrangle a curtailment to take an assignment in Europe. Considering the circumstances, it seemed to me that I was being given carte blanc to set up my own WAC officer recruiting program. That's exactly what I did, with no objection from headquarters.

WAC recruiting was high risk duty. The quality we sought was far higher than the quality the male recruiters were after, in both the enlisted and officer programs. Inevitable clashes of will happened when I turned down a woman applicant sent to me from some recruiting station. This problem never got easier.

There were many skills I had to learn in a hurry. All WAC officer publicity was my job. I had to deal with the press, make television appearances throughout the Pacific Northwest, prepare home town and other news releases about local women in training and our programs, and make speeches to groups of educators or members of business and professional organizations. That seven months of public relations work with Gray Line wasn't wasted time after all!

During this tour, my financial condition bordered on disastrous at all times. My salary, housing and food allowances barely covered necessities. The per diem allowance when traveling on official business seldom paid for both meals and billets. We received no reimbursement when we took an applicant to lunch or dinner, and any publicity materials I bought were out of my own pocket. Keeping a respectable roof over my head and sufficient food on hand to beat off the ravages of malnutrition were major challenges. This was no-frills living at its finest.

But, I did survive and managed to commission a number of women, only one of whom stayed for a full career. I always thought that my most important work was to educate the educators about the Army. If they were convinced that our programs were good, then recruits followed. I still believe that a recruiter's honesty and objectivity in dealing with educators and applicants are more important than his or her gift of gab or salesmanship.

After recruiting, I returned to the east coast to command the WAC company at Fort Belvoir, Virginia. My tour at this beautiful post, then the home of the Army engineers, began in August 1964 and ended in July 1966, years in which the war in Vietnam gained momentum and opposition to that war became the unsettling reality of our lives.

With this around-the-clock assignment, my education as an officer took giant steps forward. A WAC company of over 200 women, ages 18 to 70, was a handful, to put it mildly. The very structure of the company, with most of the women attached for rations, quarters and discipline, while being assigned to other organizations which often crossed major command lines, was the source of many challenges to my authority. More than one time, I had to go to the mat with someone about getting a woman released to attend monthly training in the company, about who authorized leaves or about who had the authority to administer punishment under the Uniformed Code of Military Justice (UCMJ). Because of this, I made it a point to visit the duty section of every WAC assigned to the company at least once or twice a year to meet with the women's duty supervisors. Life was so much easier for all concerned when our relationships were cooperative and cordial.

Any person who has ever commanded a garrison-type headquarters company can appreciate the difficulty a WAC company commander had in running her unit. In my company alone, there were 43 military occupational specialties (MOS) represented. The WACs worked in just about every staff section on post, in the hospital, the Engineer School, and in elements of three major commands which were tenants on Fort Belvoir. I also had students, including Air Force and Marine women who were engineer students.

My biggest challenge was getting the funds to properly run the company. Over the years, many WAC commanders had developed the habit of asking for as little financial support as possible from their higher headquarters. They preferred to keep a low profile and make no demands on the system, thinking such demands could jeopardize the women and their future on post. This philosophy led to chronic under resourcing of WAC units which truly worked to the women's disadvantage. Thus, my first order of business was to make sure my commander and staff knew our basic operational needs and gave us a budget we could live with. This was never easy.

I learned a lot in command. The constant barrage of problems concerning people and the need to spend so much time dealing with the five percent of the soldiers who gave you 90 % of your headaches took their toll. Yet, the experiences forced me to grow in new ways. I learned to listen much better. Sometimes, that's all the soldier wanted me to do. I learned to be more patient and tolerant in dealing with people and their shortcomings. I learned that I, too, had shortcomings, and that I sometimes made decisions affecting others which weren't very wise. I learned to go back and correct errors in judgement, and that a positive outlook is so much more productive than a negative one. And, I reaffirmed something I already knew: Most WAC soldiers are great.

As my command tour was drawing to a close, WAC Branch notified me that I was scheduled to attend a career course. I could meet the requirement by attending either the Adjutant General (AG) School or the WAC School. I chose the course offered by the US Army Adjutant General School which was conducted at Fort Benjamin Harrison, Indiana.

There was method in my madness. Twice during my command tour, WAC Branch disapproved my application for assignment to Vietnam. There was only a small WAC detachment assigned to the headquarters of US Army, Vietnam. There were a handful of WAC officers assigned to the Army headquarters and to the US Military Assistance Command, both located in Saigon. WAC Branch made it quite clear that my chances of being assigned to any unit in Vietnam were quite remote.

The AG Corps, however, had literally thousands of positions to fill in Vietnam. By attending the AG Career Course, I would be detailed to that branch for an assignment--payback by WAC Branch to the AG Corps for letting me attend their advanced course. You can be sure that the AG's were happy to accommodate my wishes. After completing the six-month AG Career Course, I was assigned to Army headquarters in Saigon in 1967 where I served as a public affairs officer (PAO).

In that memorable year, I had concurrent duties as the executive officer for the public affairs office, overseeing all administrative and personnel functions, and as a working PAO who wrote articles about our troops. I was also a frequent escort to some of the 600-plus correspondents from all parts of the world who had come to report on this controversial war. I flew from one end of the country to the other and into both Corps Tactical Zones, providing staff assistance to public affairs officers in divisions and separate brigades. One aspect of this tour really bothered me. I was not properly equipped for duty in a country where the combat zone was 360 degrees around all of us: no weapon, no flak vest or helmet, no training or briefings about the dangers in cities as well as in the jungles, no nothing. This was true for every Army woman who was there, and I resented the fact that the Army put us in such a precarious position.

As the first and only woman then assigned to the Army's public affairs office, I added many new adventures to my growing collection of war stories. I also kept a diary--the only time in my entire career that I did. Some day, I may write in greater detail about that remarkable experience.

I returned home with orders to attend George Washington University where I was to study for a masters degree in personnel management. But while still on leave, I received a telephone call from the new Chief of WAC Branch, Lieutenant Colonel Shirley R. Heinze. We had served together in Vietnam and were both proud members of a group of WAC officers who called themselves "The Bootleggers of Old Long Binh." Long Binh being the location of the Army's headquarters in Vietnam as of July '67. (The name *bootlegger* referred to the fact that our duty uniform was combat boots and jungle fatigues. This gave the WAC director a lot of heartburn. She much preferred to see us in heels, hose and the cord uniform.).

Colonel Heinze presented me with a real dilemma. She asked me to postpone my graduate schooling in order to become her executive officer as well as the company grade assignment officer for the branch. On the one hand, I would be giving up a sure thing: my masters degree. On the other hand, the branch would give me a wealth of experience about the world of assignments and a view of how the Army operates at the top. Experience like this can only be gained at DA level.

After a uneasy day of wrestling with the pros and cons of the dilemma, I called and accepted the branch assignment. There was some real concern associated with making this decision. At this point, I had no idea whether I would ever again have the chance to go to graduate school at the Army's expense. Also, this probably meant three more years of branch duty at a time when, perhaps, I should be getting staff experience outside the Corps.

Remember: I was a reserve officer, just "Christmas help," according to many regulars. By law, a reserve officer could only serve a maximum of 20 years on active duty. By the time I completed the tour in WAC Branch, I would only have nine years to serve before mandatory retirement. Given the undeniable constraints on my future, it didn't seem likely that either a graduate degree or any first-rate assignment was on the horizon for me after the branch assignment.

Once again, I was wrong. The decision to take the position in WAC Branch was one of the best decisions I ever made. What initially seemed a high-risk move on my part proved to be one of my most valuable learning experiences. This assignment, more than any other, convinced me that I wanted to remain in the Army for as long as I could serve.

I was responsible for all company grade (lieutenant and captain) assignments for WAC officers. In fact, any action affecting a WAC junior officer was my responsibility: schooling, assignments, detail to other branches, any personnel action request, career counselling, on and on. In my three years with the Branch, I got to know the file of every woman lieutenant and captain in the Corps. At one time or the other, I met most of these women. I knew their strong points and their weak points; knew who should do well in command, who should be a great instructor, who was in trouble because of poor performance, poor behavior or poor personal appearance. I could also tell you the women who were well ahead of their peers in every category and were fine prospects for early promotion.

In many ways, working with the young officers was another form of troop duty. This time, I was trying to lead officers, and the officers presented me with as many challenges as had the enlisted women at Fort Belvoir. The days were never dull and the tests to my ability and patience were never small. Colonel Heinze told me that after I left WAC Branch, she had my replacement review the company grade files and then remove some of my more outrageous notes about officer assignment actions. Admittedly, there were times when I used those notes to voice opinions or blow off steam, especially when generals or even admirals tried to influence where an officer was going to be assigned. Any note beginning "How can I offend thee ? Let me count the ways..." was a cinch to be purged.

Following WAC Branch duty, I attended the 10-month resident course for officers at the US Army Command and General Staff College, Fort Leavenworth, Kansas. The four WAC and two Army Nurse Corps student officers were barely visible specks in the male student population. There were approximately 1200 men in the Class of 1972. This was my first real instruction in the combat arms, tactics, strategy, joint and combined operations and high level staff work.

Earlier in Vietnam, I had experienced what it was like to be the only woman assigned to an outfit--in this case, the public affairs office in Vietnam (70 men to one woman). At Leavenworth, I was the only woman in Division B and in my class section: the "token WAC", as I described myself. Being the one and only woman was an experience many of us who stayed in the Army through WAC integration would often have.

The assignment which followed my schooling was both unexpected and the answer to a prayer. The first family crisis of my life was in full swing early in 1972. My mother was terminally ill, expected to live a matter of months. I learned this in February. While I was still trying to get a grip on the situation, WAC Branch called to tell me that I was being reassigned to Washington to be the plans and programs officer in the WAC Director's office.

I received this news with a great deal of relief and no small measure of apprehension. After completing all course requirements and tests in early May, my emergency leave was approved. This cleared the way for me to pack my household goods and head for my parent's home outside of Washington. My father needed help in caring for Mom. She died nine days after I arrived home.

The day in June that I reported to the Director's office, there was no one to greet me except Mary Larrick, the friendly and helpful secretary to the WAC Director, Brigadier General Mildred I. Bailey. The general and her sergeant major were in Southeast Asia visiting the troops. The deputy director, executive officer and the plans and programs officer I was to replace were in an all-day conference with a host of DA staff officers. This group was making plans and laying the foundation for the most significant increase in WAC strength since the days of World War II.

I spent the day alone in the office with Mrs. Larrick. The telephones rang constantly, with calls coming from all parts of the world about the WAC expansion program already underway and the critical shortage of women's uniforms. It didn't take me long to realize that the lack of women's uniforms was at crisis level and getting worse with each call. Since uniforms were going to be one of my responsibilities, every complaint about shortages was carefully recorded for future reference. All other calls for action were noted, too. We needed many more female drill sergeants at WAC Center, and the shortage of barracks to house the trainees was a serious problem.

By the end of that first day, I knew this assignment was going to be a real adventure. The WAC strength figures I committed to memory on day one are still there. In June 1972, there were 11,349 enlisted women, 19 warrant officers and 901 officers on the WAC rolls. Action was already underway to double that strength. Now, there were plans being drawn up to both speed up the process and recruit an even higher number of women. Problems or not, the WAC was going to grow much more rapidly and become far more diversified in its utilization and assignments.

I am sure that the women's movement played a part in stimulating the Army and all other branches of the armed forces to thoroughly review all personnel policies in order to identify those which were gender based and usually discriminatory. Military men and women were not managed by a single set of laws and policies. There was institutionalized, blatant discrimination negatively impacting women's promotion, schooling and assignment opportunities. It was not until 1971 that an Army woman (married or single) who was pregnant could apply for a DA waiver to remain on active duty. Prior to then, pregnancy meant immediate discharge.

While the services automatically gave extensive benefits to a man's wife, the military woman had to prove that she was providing 51% or more of her husband's support before she could declare him as her dependent. It took a Supreme Court decision in 1973 to correct this inequity. We owe a lot to those tough minded and courageous women who took the Defense Department to court on this and other issues.

The women's movement, together with the civil rights movement, opened the eyes of senior military leaders to the depth and breadth of discrimination against women built into much of our personnel policy.

The likelihood that the Equal Rights Amendment (ERA) would be ratified was a further goad to action. President Lyndon B. Johnson took an early step forward for women when he signed Public Law 90-130 on November 8, 1967. This law removed the restriction on military women's promotions and eliminated the two percent strength ceiling on the number of women who could be members of the regular armed forces.

This major change in law was essential before anything could be done to appreciably increase the number of women in the force. The WAC Director, Colonel Emily Gorman, and the other women service directors played key roles in convincing Defense Department leaders that this was a wise move. While several years passed before the Army promoted its first two women to general officer rank, this new law at least made such a

promotion possible. When this happened in June 1970, Brigadier Generals Anna Mae Hays, Chief of the Army Nurse Corps, and Elizabeth P. Hoisington, Director of the WAC, were the first two Army women to wear the stars. For all of us, this historic event, the shot fired 'round the world of our careers. was a time of celebration.

What really galvanized Army leaders to dramatically increase WAC strength was the end of the draft which loomed on the horizon. In 1972, the Defense Department was well along in planning for an all-volunteer force. The withdrawal of American troops from Vietnam was moving rapidly. While the authority to draft men would not officially expire until July 1973, the services knew that this practice would probably end as of January that year.

The need to enlist far more women in the future was a valid assumption. Influenced by the very negative and hostile attitude of Americans toward the war in Southeast Asia--hostility which seemed especially directed at the Army--senior Army leaders knew that young men who no longer feared the draft would stay away from recruiters in droves. Meeting manpower needs would be difficult. Thus, every branch of service gave top priority to removing a broad spectrum of irritants which a volunteer force would not tolerate. Plans to build better, roomier barracks were prepared, and efforts by the Defense Department to improve the pay and allowances for service personnel were intensified.

You would have to be a participant in the process to understand the intensity of planning and the level of frenzied activity which characterized the DA staff during these months. Our work days were long and tedious, but never boring. It often seemed that putting out huge fires was our primary occupation. The Pentagon atmosphere crackled as old and new policies concerning military women met, clashed, worked themselves out, or remained battlefields on which the director and DA staff officers fenced and parried. The Army was making wholesale changes to its culture, and the director's office was in the eye of that hurricane.

General Bailey and her staff remained on guard duty all the time as the Army raced along at mach speed to recruit, clothe, train, assign and house the burgeoning number of WACs. Gender discrimination without logic to support it had to be purged from regulations and policies. All of the manning documents had to be reviewed and changed to show that women could be assigned to just about any position except those that were combat positions. This was at best a hasty and flawed process which has required many corrections over the years.

No one felt the pressure of expansion more than General Bailey. While her views were sought in virtually every step taken to increase the size of the Corps, she was not the one who controlled the action. The Secretary of the Army and the Army Chief of Staff called the shots. They did, however, give her advice careful attention, accepting her wisdom most, but not all of the time.

It was apparent to us that the days of the Women's Army Corps were numbered. With many of the assignment barriers removed, WACs were being trained in nontraditional MOS and assigned to division support units in ever-increasing numbers. A five-year test to

determine the interest level and aptitude of women who had enrolled in the Reserve Officer Training Corps (ROTC) Program at 10 colleges and universities was canceled before the end of the first year. Professors of military science and training throughout the country called to demand that ROTC be offered to women at all of their colleges, since male enrollments had fallen sharply. Their request was approved, and in the fall of 1973, the Army senior ROTC programs on all campuses were opened to coeds.

Because ROTC women were required to wear the Army green uniform, the supply problems just got worse. When the Army decided to open the Junior ROTC (JROTC) Program to high school girls, General Bailey demanded that the standard woman's uniform not be issued to these cadets. With the help of the US Army Natick Laboratories, she came up with a nonstandard outfit which JROTC girls would use for the next several years, to the female JROTC cadets' chagrin. They, like the boys, wanted the Army green.

In short order, the Army's aviation program and airborne training were opened to qualified women. A brief test to assess the capability of women to perform military police (MP) duty led to opening the MP Corps to women who could meet the requirements. The presence of women in the MPs, the aviation and the airborne programs spotlighted the urgent need for the Army to develop special uniform items and equipment for the women entering these new fields. (Some of these problems still remain in 1996.).

With these few examples, I have shown only the tip of the enormous iceberg of change with which the Director's office and the Army-at-large had to deal. The expanded utilization of military women was an idea whose time had come, but no one--leader or led--was ready to handle the broad consequences of opening this particular Pandora's box.

While all of this was happening, WAC Center was in its own true crisis of expansion. The constantly growing population of WAC recruits led to the activation of two additional training battalions and a headquarters battalion for a large staff end faculty which included an increasing number of men. The Corps could no longer supply a sufficient number of qualified and available women to perform the training mission. Women had to share their power base with the men.

Later, a second WAC training brigade was opened at Fort Jackson, South Carolina. Its two battalions trained recruits from reserve as well as active components. Both of these brigades experienced monumental logistical problems, with the shortage of uniforms shaping up as a real disaster. The fact that Fort Dix, New Jersey and Fort Leonard Wood, Missouri were also identified as future WAC training posts did nothing to lessen the problems.

Retrospectively, I am surprised that some of the uniform actions I took in General Bailey's name didn't buy me a one-way ticket to the Army Disciplinary Barracks at Fort Leavenworth. In her absence and in her name, I authorized the purchase of items which under normal circumstances would never have been approved: things like 6000 pairs of black oxfords which were originally rejected as substandard and blue, short-sleeved shirts which were made for women postal workers, not WACs. The blue shirts were needed to complete the women's physical training (PT) outfit. I also told the logisticians to buy black

London Fog raincoats right off the factory shelves (the trainees who were issued these all-weather coats complained to one and all that "they looked like pregnant penguins when they marched!"). Providing some semblance of a uniform to the troops was what mattered. Besides, when the authentic uniform items were available, the "quick fix" items would be replaced at no cost to the women concerned.

I might add that while the debacle over women's uniforms raged, General Bailey was racing full speed ahead to acquire an entirely new ensemble for the women, an action which she firmly believed was long overdue. Phasing new items in while trying to furnish the existing uniform did tend to muddy the waters for the logisticians. I'm sorry to say that many former WACs remember General Bailey more for her uniform efforts than they do for her courageous actions to insure the women's welfare while advancing their career opportunities. Hers was a very tough and seldom appreciated battle.

The Army in the Field: A Different Perspective

In February 1974, I left the director's office and headed for Atlanta, Georgia to become the WAC Staff Advisor to the Commanding General of US Army Forces Command (FORSCOM). On the day I left, I told General Bailey that, in performing WSA duty within this huge and scattered command, one of my goals would be to put myself out of business as a WSA. The Army was rapidly moving toward a far greater integration of women into its mainstream. It was time for men who commanded the units to which the women were assigned to assume full responsibility for their women soldiers.

For the next 28 months, I traveled all over the country, to Alaska and to Panama visiting FORSCOM installations. The majority of the Army's combat and combat support units which were not deployed overseas were found on large FORSCOM installations. For example, Fort Bragg, North Carolina was home to the 18th Airborne Corps and the 82nd Airborne Division. The 101st Airborne Division, also part of 18th Airborne, was at Fort Campbell, Kentucky. The 1st, 4th, 7th and 9th Infantry Divisions were stationed at Fort Riley, Kansas; Fort Carson, Colorado, Fort Polk, Louisiana and Fort Lewis, Washington respectively. Massive Fort Hood, Texas was training base for the III Corps, 2d Armored Division and the 11th Air Cavalry Division.

This list is by no means all inclusive. Fort Stewart, Georgia was in the throes of reactivating to be home for the 24th Mechanized Infantry Division; the Southern Command in Panama and combat units in Alaska were other major forces answering to the four-star commander of FORSCOM. There were also separate combat and combat support brigades, together with large logistical commands, which were co-located with the divisions. The aggregate FORSCOM troop population was formidable.

Thousands of WACs were being sent into this bristlingly macho world of FORSCOM's warriors. Thousands more were arriving in Germany where the forward-deployed combat and combat-support units of the US Army, Europe (USAREUR) were stationed. Both FORSCOM and USAREUR would bear the brunt of WAC expansion in the years to come.

It didn't take long to see that DA's precipitous plunge into WAC expansion had placed a heavy burden on the Army in the field. Cultural and institutional change came fast and furiously. The Army's senior leaders had given little thought to preparing officers, NCOs and soldiers for change of this magnitude. As thousands of women were being assigned to previously all-male units, it was apparent that little attention had been paid to what changes in procedures would be needed, how billeting would be handled or how much of an orientation the men should receive about the women soldiers. The women also needed briefings. This new Army they were in was not the one the recruiters back home had described to them.

Earlier, there was one office in the Pentagon which urged the Army to proceed cautiously and carefully with WAC expansion. It was the director's office. Several of those senior women had gone through the earliest days of the Corps in World War II. They knew what problems loomed on the horizon. But the director's advice was first derided, then ignored--considered by many senior Army men to be nothing more than the "cluckings of the Corps' old mother hens." Had the staff listened, the Army could have avoided many of the serious problems which arose.

During this tour, I visited every FORSCOM post at least once but sometimes more often. Without waiting for DA to furnish guidance, some of the division commanders and staffs had given a lot of time and thought to planning to receive the women. It was usually an easy task to assist and advise units like these where applied common sense was the order of the day.

Other divisions were disasters in the making. There were senior commanders who did not want the women in their units. These were the men who marginalized the value of any woman soldier and thought nothing about pulling highly trained women specialists out of their assignments to make them clerks, secretaries or receptionists. Such units were breeding grounds for malassignments, sexual harassment and abusive behavior directed toward women. A hostile command climate which started at the top was usually evident down through every subordinate unit.

Housing was a major problem. None of the division billets were designed with women in mind. More often than not, commodes without doors, gang showers, and windows without curtains characterized barracks the women were to use. But leave it to the women. They were invariably quick to get themselves organized. They scrounged materials and found ways to upgrade their surroundings with scatter rugs on the floors, colorful spreads for their beds, pictures and posters on the walls, and curtains for privacy in the showers and around commodes. I applauded when they converted urinals into planters, then took great pleasure in taking crusty old male NCOs and battle-hardened officers on inspection tours of their areas. The men were usually at a loss for words.

Billets were an especially vexing problem for units that had only a few women assigned. When space was already tight for the men, the commander could not turn an entire barracks over to the women just to safeguard their privacy. Some accommodation had to be made so men and women could share barracks and still insure privacy for both sexes. In cases like this, there were no easy solutions.

If time and space permitted, I could tell you dozens of war stories about WAC expansion. The resiliency of the women throughout these years of painful adjustment was wonderful to behold. Among themselves, they used their innate genius for survival, sense of humor and their concern for each other as their principal means to safely get through what can only be called their trial and error management during changing times.

But there were moments when I was outraged about what happened to some women. When a woman medic at Fort Devens told me she had been physically knocked down by her platoon sergeant while standing in formation, I was outraged. This woman would not complain, since the sergeant only reflected the attitude of the company commander. I was outraged when troop commanders in the field refused to accept women in their units and got away with it. I was outraged when women in the band at Fort Sam Houston, Texas were forced to wear men's uniforms and hats when marching so that no one would know that they were in the band. And I was outraged by glaring incidents of sexual harassment and every incident of rape in the barracks which was reported, but more often than not treated by male commanders as "boys will be boys" events. Memories such as these can never be erased.

Don't get me wrong. I met hundreds of male NCOs and officers in FORSCOM who welcomed the women into their units and treated them as fellow professionals. Any problems that arose were dealt with quickly. The positive command climate they established was the best and only consideration the women wanted.

While much of the change I have discussed primarily affected enlisted women, major changes were also underway concerning the career management of WAC officers. On July 1, 1974, WAC Branch ceased to operate. On that day, every WAC officer was permanently transferred to another Army branch or corps which had been assigned responsibility for her future utilization. By such a move, the WAC was moving that much closer to its disestablishment.

After more than 14 years of service, I became an instant MP officer. I had chosen the Military Police Corps over the Adjutant General Corps for one good reason. I was sure that so many WAC officers were going to the AGs, they would never get good assignments. With only a few of us lieutenant colonels and colonels opting for the MPs, we just might be given more challenging things to do. The truth of the matter is, I received no MP schooling and was given only one MP assignment during the remainder of my career. This didn't deter my friends, however, from calling me "Foote, the Fuzz."

Many WAC officers both despised and dreaded this change. They keenly felt the loss of the highly personalized management they received from WAC Branch. They had real fears concerning their future with branches which knew little about them and which might give them the assignments no man wanted. (This did happen frequently). There were WAC officers who did fall through the cracks at this time. Those with more than 12-14 years of service seldom received the type of training from their designated branches which prepared them to be effective in their new roles. Some of them were so disheartened, they left the Army, embittered and disillusioned.

The young lieutenants and captains had plenty of time to catch up with the men provided their new branches quickly scheduled them for essential schooling and on-the-job training. Their transition was considerably less painful.

I must tell you that it was necessary for years to brief DA selection boards concerning women whose careers were a mixture of both WAC and other branch management. When WACs only competed with each other for promotion, they followed the guidance in regulations and rarely inflated their evaluations of other WAC officers. Further, those women who were temporarily detailed to some other branch usually received less favorable ratings than their male contemporaries. Add to this the evaluations women received while transitioning between branches and the fact that men consistently inflate reports written about men, you find that women had a hard time competing. The briefings helped to insure a more even playing field for the women where promotion, schooling and command selection were concerned.

In the spring of 1976, I received word from DA of two very surprising actions which would have a great impact on my future. First, I learned that I was one of six women selected by a DA board to command a battalion. We were the first group of women selected in this manner. Second, I was notified that I had also been chosen to attend senior service college at the US Army War College located at Carlisle Barracks, Pennsylvania. It was up to me to decide whether to command first or to attend the course at Carlisle. What a areas choice!

I chose the Army War College (AWC). Any number of disasters during a command tour could wipe out my opportunity for senior service college. Knowing that battalion command was high risk territory for any officer, it just seemed logical to get that senior service college year behind me and then take on command. That's what I did, and I've never regretted the sequence.

It just seemed unbelievable that all I had to do for one year was go to school. But, go to school I did: to both the Army War College and to Shippensburg State University where, along with 30 of my AWC classmates, I enrolled to earn a masters degree in government and public administration. It was a busy but interesting year. On campus at Shippensburg, it was easy to spot the men from Carlisle: pants and shirts clean and pressed; short hair, no beards, shoes shined; older than the average student by 20 years, and more serious. In our classes where bare feet, cut-off jeans and tank tops prevailed, we certainly stuck out.

But most of our Shippensburg instruction was done at the War College. Our professors were like our peers except when it came time to give us our course grades. Then they were professors. This was a fine program worked out by Shippensburg and the Army War College to everyone's advantage.

After graduating from the AWC in June 1977, I moved to Atlanta, Georgia where, as a Governor's Internship Program participant, I conducted a 10-week study of personnel management operations in the Georgia State Department of Human Resources. This study completed my course requirements for the master of science degree from Shippensburg.

In September 1977, I reported to Fort McClellan with two months to wait before I assumed command of the Second Basic Training (BT) Battalion, a unit of the US Army Training Brigade. While the Chemical Corps had moved from the post, a new corps had moved in from Fort Gordon, Georgia to conduct its basic, advanced and special courses: the US Army Military Police Corps. Training brigade BT units and cadre were housed in buildings which dated back to the 1940s and 1950s, while the MPs moved into new barracks and new administration buildings. The MPs also had new gymnasiums for their troops. In the minds of many, the training brigade clearly spotlighted the "haves" and the "have nots" on post.

Because I was not scheduled to begin battalion command until November, I was temporarily assigned to work for Colonel Mary J. Grimes, the Chief of the Directorate of Training at the MP School. I had known Jane Grimes since the days of my first assignment at Fort McClellan. We also served together in Vietnam. She, too, was a "bootlegger of old Long Binh."

I was happy with this arrangement. For one thing, Jane Grimes was one of the finest officers I have ever known. She had been an outstanding commander of the 2d BT Battalion and was the officer who taught the MPs how to conduct basic training, something they had not done at Fort Gordon. A new program called One Station Unit Training (OSUT) had gone into effect for them, requiring the MPs to teach both basic and advanced training to recruits. Jane is the officer who saved the day for them by teaching them how to conduct the basic program.

While Jane gave me several minor projects to do, she also gave me all the time I needed to get ready for command. I had to qualify with the M-16 rifle, learn how to throw a hand grenade, how to work with a buddy and storm a bunker, how to fire the LAW (light antitank weapon) the M-60 machine gun, and much more. While my battalion trained women only, the women had to master an entirely new field training program: defensive operations. We were sending women out to serve with the men, so they had to know how to fire any weapon their unit might use and how to take part in defensive combat. These were essential skills each trainee needed in order to graduate.

The PT program was far more rugged than any program I had taken in basic training. To graduate, each woman had to run two miles in a time prescribed by her age. She then had to do men's pushups and situps with the number of each also determined by her age. These exercises were the three parts of the new Army PT test, and every soldier had to pass the test every six months. My work was cut out for me.

I spent many hours in the field learning to handle the weapons, then I qualified with the M-16. Men who were in the infantry or MPs were my ever-patient instructors. I got to know most of them very well, and this helped when I took command.

As for PT, I ran just about every morning from 4:30-5:30, then did situps and pushups (a real struggle) in my quarters. Believe me, all of this was a shock to my 47-year old body. Women had never been required to perform such strenuous PT before, although I had made it a point to do some form of exercise daily. This transition to a much more

physically demanding program was long overdue. We had to equalize training demands for both men and women, and the sooner the better. This has paid rich dividends, but for thousands of Army women who had trained under less rigorous physical standards, the conversion was rough.

When I assumed command of the battalion in November, I was ready to run with the troops and critique their training more confidently. It was a good feeling. Having been away from troop duty for more than a decade, I needed that boost provided by extra PT and extra time in the field.

The battalion command tour was rich with examples of the changing times. In the first month, the WAC flags of the First and Second BT Battalions were retired, and we began to fly the blue and gold flags of the Training Brigade. In the early spring of 1978, these two battalions began to get ready to train men as well as women. Earlier, the concept of integrated BT had been successfully tested at Fort Jackson, under the expert direction of Colonel Grimes. It was no surprise to us when the decision was made by DA to integrate the basic training of men and women who then would perform noncombat duties in the field.

While this planning was underway, I was called to Washington to serve on a DA board which was to select officers for the Command and General Staff College. In my career, I served on many boards. Senior women officers were in short supply, so the handful who were qualified for such duty were over-utilized. I understand the same is true in 1996.

While I was there, the Office of the Director, WAC was disestablished. I was present for the ceremony on April 28, 1978, as were many other women who had served in the Corps, to include several former directors. The moment was bittersweet. Most of us had accepted the fact that women could no longer be treated as a separate entity if they were to be given a greater Army role to play. But it hurt: it hurt to know that the special enthusiasm and esprit for which the WAC was known would vanish into the past.

There were fears, too. From now on, women would compete with men, and the rules by which the women would be measured were men's rules. The safety net provided each WAC was gone, and every woman had to become her own best career manager. None of us knew what lay ahead, but we did know that it was time to take the chance that today's action would lead to better career opportunities for Army women.

Abolishing the director's office and the positions of director and deputy director marked the effective end of the Women's Army Corps. The Corps structure, however, remained until it was statutorily discontinued in October 1978. The 36-year history of this magnificent organization is on display for all to see at the Women's Army Corps Museum, Fort McClellan.

With board duty behind me, I returned to Fort McClellan in May 1978 to continue preparations for integrated basic training. As one of many who had often been "integrated" into some Army program belonging to the men, I had a pretty good idea of what some of

the pitfalls were. First, I told the post public affairs people that it was going to be business as usual when the men arrived in the battalion. Every time an Army woman entered some previously all-male program--aviation, airborne, the US Military Academy, air assault training--the press had a field day. No woman wanted to be in this spotlight. She knew the men in the program with her would resent the special attention she received. And, she was right about that. We didn't want this to happen to the men of the Second Battalion.

Second, common sense would determine how barracks space was to be assigned in mixed companies. In a five-platoon company with only one platoon of males, the males would be billeted on the first floor while the women took the second and third floors. With two platoons of men, the third floor would be designated for them and the three female platoons would take the first and second floor bays, and so on. Common sense would also be applied when dividing bathrooms and showers.

While gender determined sleeping arrangements, platoons were set up as mixed. Coed training from the start was essential if the men and women were to bond together as soldiers, not according to gender. This worked very well, although we had to work out the lines of authority among the drill sergeants of the platoons involved.

All trainees would be assigned to one of five different PT levels depending upon their individual fitness. The trainee's fitness level was determined by a diagnostic PT test given before training officially started. Troops in level one, both men and women, were very fit from the beginning. They easily exceeded the PT standards. Those in level five were pitifully unfit. This group had only seven weeks to reach standard. Some of them never did and had to be recycled for additional training.

Finally, we had to figure out just what clothing, health and welfare items for men had to be stocked at the post exchange in our vicinity--one we all called the WAC exchange. My sister commander in the First BT Battalion was Lieutenant Colonel Myrna Williamson. She and I paid a visit to the WAC PX to discuss the men's supply needs with the manager, a woman who had held the position for many years. I must say that a few of those items were strongly opposed by the manager and only provided under duress. Reason prevailed, however, and men's "necessaries" were on the shelves by the time integrated training began in the summer of 1978. I might add that the presence of condoms on the WAC PX shelves sent seismic shock waves throughout Fort McClellan. Truly, a new day was dawning.

Integrated basic training worked well from the very beginning. I spent more time counselling commanders and drill sergeants about their attitudes than I did in dealing with truculent troops. Left alone, the troops solved most of their male-female problems and worked well together in either the classroom or in the field. Companies did not degenerate into Sodom and Gomorrah and standards did not fall.

The types of discipline, however, changed with the entry of men. Incidents of drug use, assault and battery and drunk and disorderly conduct rose appreciably, with men the culprits in virtually every incident named. There was also a marked difference between most of the men and women in terms of their educational level and mental category.

Typically, women were better educated and better qualified. We were not recruiting the highest quality of men in 1978, but the women were first rate. More often than not, women helped the men with classroom work and men helped women with field training subjects. It was a good fix, but the social distance between the sexes was pretty wide. All they had in common was the training.

The three-star general in charge of Army-wide training flew down from Fort Monroe, Virginia to attend the end-of-cycle briefing conducted by First Lieutenant Arlene Crook, Commander of Company A, the first company of the battalion to conduct integrated training. At the conclusion of her detailed report, the general asked Lieutenant Crook what was the most serious problem she encountered in this training cycle. The lieutenant, who was so short she had to stand on a box to see over the lectern, looked the general in the eye and told him that male soldiers didn't know how to wash clothes. They loaded the machines too heavily, then poured in far too much soap powder, guaranteeing the machines would stop working in no time. She rounded out her complaint by telling the general that because of the men, her Speed Queens were constantly breaking down, creating problems for all the other troops in the company. That was a problem ! The general was still shaking his head as he left to fly back to Virginia.

Of course there were problems but none were unsurmountable. Women commanders and drill sergeants had to learn the regulation governing men's uniforms. There was a steady *supply* of uniforms for men and this just heightened the frustration we felt over how poorly the women were supplied.

Don't believe that men never cry. They do: when they want to quit the program, when some bad news is received from home, when they are failing and for many other causes--just as female trainees do. I relieved two male drill sergeants: one for adultery (with one of his trainees) and one for trying to win sexual favors from several of the females in his platoon. Both men cried; their careers were over, and they knew it. I briefed every new drill sergeant, along with his or her spouse if they had one, when they first arrived. I told them their conduct with troops would be under constant scrutiny and warned them of the types of misbehavior that could lead to their relief. Some sergeants just never listened.

The tour passed too swiftly. As a battalion commander, I tried not to make the same mistakes in judgement I made as a company commander and to put to good use lessons learned while at Fort Belvoir many years before. Here, I learned a lot just by observing both positive and negative leadership examples. Sadly, I learned that being the battalion commander placed a greater distance between me and the trainees. After all, company commanders commanded them, I commanded the company commanders and tried to be a buffer between them and the brigade headquarters. I also learned that the truly effective leader is not afraid to admit mistakes to subordinates who already know that he or she has made them. How that leader goes about correcting such mistakes is what matters with those who are led.

I relinquished command on July 5, 1979, knowing full well that my career would end at Fort McClellan. In seven months, I would be forced to retire with 20 years of active duty. The thought of ending my Army days as a special projects officer wasn't very thrilling. But then, the career scenario changed again.

I was told that I had been selected for promotion to colonel. With this action, DA invoked its authority to extend the service of a reserve officer for two additional years from the date of promotion. It looked like my Christmas help status would weather two more years, plus however long I had to wait before being promoted. That suited me just fine.

With orders in hand, I drove to Carlisle, Pennsylvania where I was assigned to the faculty of the Army War College. This was another of those pioneering "firsts" for an Army woman of my vintage. The War College was a venerable military institution which since 1903 had prepared thousands of men and a dozen or so women for staff end command at the highest levels. Its faculty had been male only forever, and I had no doubt that a sizable number of the present faculty members wanted to keep it that way.

What a fascinating school! I was assigned to the Department of Command and Management (later changed to Command, Leadership and Management), and given responsibility for all instruction in personnel management, both military and civilian. I also had to write both the personnel and the installation command and management chapters in our text about how the Army is run, and act as coordinator for several electives the students would be offered in the spring. I was assigned three students--all divorced men--to advise throughout the year. Their marital status was the factor which determined why those men were assigned to unmarried me. There would be no wife to object to her husband having a woman as advisor.

This was an assignment which initially filled me with terror: so much to learn, so little time, so many ways to fall flat on my face! In two weeks, the students would begin class, and I had to be ready to serve as teacher, personnel guru, and advisor. Any course taught by the department was mine to conduct for a seminar of 16 eager, overachieving colonels and lieutenant colonels, including an International Fellow from Turkey. While most of the officers were from the Army, I also had men from the Navy, Air Force and Marines: a combined (or allied) force, if I ever saw one.

That Class of 1980 was memorable. Happily for me, all seminars were given a "get acquainted" orientation period with their three assigned faculty members who represented the instructional departments of Command and Management, National and International Security Studies, and Military Plans, Policies and Operations. The orientation helped us break the ice and get to know each other. Just being a woman gave me more attention from this group than I wanted. I did get the feeling, however, that the seminar was on my side in this brave new experiment.

Early in the year, I began to capitalize on the talent, experience and expertise of the students. Believe me, I took every opportunity to turn the spotlight on them when it was appropriate to whatever we were discussing. For most of the year, I could find some member of the seminar who had first-hand experience in whatever we were talking about

that day. When we reached the week of the dreaded Army Planning, Programming, Budgeting and Execution System (PPBES)--a week when the charts describing the steps and timelines were wrapped around the room--I saw some strong men who were ready to weep just from having to listen as I tried to talk them through the system. Invariably, there would be some member of the group who had actually worked in PPBES at the Pentagon and could shed the light of experience on the entire, murky process. Knowledgeable students saved many days for me.

Prior to joining the faculty, I was convinced that officers who held these lofty positions were among the truly blessed. Back in my AWC student year, it seemed that faculty members were only at the school a few hours daily. I made the very erroneous assumption that once a faculty member had mastered his subject area, he had all the time he wanted to devote to golf, family, having long discussions with cronies over breakfast at Faye's Country Kitchen in Carlisle, or traveling to exotic places to gather more information for his courses. To put it mildly, I was wrong.

This was tough duty. For three years, most of my days, evenings and weekends were devoted to reading, researching and writing instructional materials for the courses. Preparing for each seminar consumed many hours, especially when your topic was one with which you had little experience. There were leadership papers to read and evaluate, research projects to supervise and students to advise. In the electives, you either taught the course yourself, with the assistance of expert guest speakers, or you ran administrative interference for a visiting professor who was the instructor. You strongly supported the social calendar of the college and the commandant, which means that you went to more luncheons, dinners and receptions than you care to remember. And, since I was the only faculty women, I wound up at more of these social events than did the men.

The fact that personnel policy was so totally perishable forced me to rewrite the personnel chapters every year. Department of the Army seemed to be constantly reorganizing and renaming portions of its staff. New acronyms abounded, and the personnel policy effective today was ditched tomorrow. Just trying to stay current was a major undertaking. I drove to Washington every month to walk the halls in the Pentagon and to grill my contacts there about what was going on.

The action officers who put together the "BUSS" (backup study sheets) books for the Deputy Chief of Staff for Personnel (DCSPER) to use in appropriations hearings on the Hill gave me a complete set to use. This included sensitive, classified papers about topics not yet briefed to soldiers. In turn, I provided every AWC student a copy of all papers except those classified confidential and above. These could be reviewed in my office.

I must confess that the BUSS concerning Army women received extra attention. The late 1970s and early 1980s were years when the numbers of military women in all branches were climbing rapidly. Just by reading the BUSS and talking to action officers at DA level, I could sense that the Army and women's utilization were on a collision course

This happened very quickly after the Republicans captured the White House in 1980. In 1981, one more study concerning Army women began--this one, to be a review of every other recent study of Army women to determine if they eroded the readiness of the Army to perform its combat mission. Some generals attending the Army commanders' conference in October 1980 had inferred as much.

You can imagine what Army women thought about this! Department of the Army studies women more than any other group in its soldier population. Years ago, while being studied once again, I reached the sad conclusion that women's studies are vehicles for institutional inertia. As long as women are being studied, no one has to do anything about any so-called problem that led to the study in the first place. I hope that this is not the case today.

The results of this study did nothing to raise the morale of Army women. While there was absolutely no evidence of women having ever eroded a unit's readiness or effectiveness, this document became the basis for creating a new policy to more tightly exclude women from combat: the Direct Combat Probability Code, or DCPC. Its categories of combat probability, coded P1-P7, meant that women who were trained in specialties open to them could be refused assignment to combat support units needing their specialties when the units' code for the jobs was P1. Translated, this meant that such units were physically located where combat was most likely to occur, in someone's opinion.

In other words, *where* in the theater a woman was to be assigned was more important than *what job* she was going to perform. This was sheer, unworkable nonsense, but commanders were saddled with this policy into the 1990s. Units coded as direct-combat units remain closed to Army women.

Another comment or two before we move on. General Edward C. "Shy" Meyer, the Army Chief of Staff who ordered the study and approved the DCPC, also issued the order to stop integrated basic training. This was solely his decision, and I doubt if any staff paper in existence provides the rationale or justification for ending the program. I did hear some mumblings, again not recorded in writing, about how the men weren't "sufficiently challenged" in training with women. General Meyer also put out the word that all basic training battalions would be commanded by combat arms officers in the future. This action eliminated some of the key commands a woman could have.

These totally demoralizing events came as no surprise. As an AWC student, I had asked General Meyer when the Army was going to clarify its confusing policies governing women's assignments. Then the Army's Deputy Chief of Staff for Operations, General Meyer replied that he did not know. "After all," he said, "women are a management dysfunction for the Army." It was apparent to every student that the general was uncomfortable with the topic. I must say that while I have been fabled many different ways by the Army, this was the first time I had been called a management dysfunction!

One additional footnote: more than a decade after basic training had been separated by gender on orders from General Meyer, the training has again been integrated. It's unfortunate that thousands of Army men and women now serving who came through the training base in those interim years missed out on this opportunity to learn each other's soldier potential from the very beginning.

In the Carlisle years, I also was often called upon to make speeches and give interviews requested by a number of curious reporters. At the "request" of the Army Chief of Public Affairs, I appeared on the Donohue Show out of Chicago to discuss such non-controversial topics as women in combat and whether women should be drafted. Other Donohue guests for this show were feisty White House correspondent Sara McClendon and Helen Rogan, author of a book about integrated basic training entitled "Mixed Company." I spoke my mind, supported using women in combat roles provided they were fully qualified, and said that women, like men, should be drafted if we ever had go that manpower route again.

Within a week of the Donohue show, the Chief of Public Affairs called the War College commandant and obtained his permission to send me off to ABC's "Good Morning, America." Again, the draft was the subject. This time, I debated a very nervous 17-year old high school girl from Texas who thought the mere notion of drafting women was awful. I disagreed.

Most military professionals dread television appearances and try their best to avoid them. Since I had been volunteered, my AWC friends came by to pay their respects and make sure that I understood that I was in mortal danger. I did. Appearances before cameras with blinking red lights is not one of my favorite pastimes, but I have done this often. I make sure that, whatever the topic, I always invoke the caveat that my opinions are just that: my opinions, not DA policy. This is the only shield I have ever needed.

In March 1980, I was promoted to the rank of colonel, something I had never expected. After that, I did think from time to time about what I would do when I left the Army in March 1982. Of course, I would return to civilian life from my present duty, and then probably move back to Washington to be near my friends and family. This did not happen. Fate came knocking again, delivering a one-two punch to my best-laid plans.

The Defense Officer Personnel Management Act, a complex piece of legislation which had been bouncing between the Defense Department and Congress for almost a decade, became law in December 1980. I will not begin to go into its many provisions except to tell you one thing. This law suddenly made me eligible to be a Regular Army officer. It wasn't long before I received a letter from the career managers in Washington, offering me a RA appointment. Just imagine, after almost 22 years, I could be one of the permanent hires, not just Christmas help.

Before signing up, however, I made sure that being RA would entail no further service obligation and that I could retire when I wanted to, as long as our country was not at war. Assured of this, I took my oath as a regular on a Saturday morning. I was at the school, dressed in jeans and a sweat shirt, working on several upcoming courses. Colonel Larry Kaulmann, a fellow faculty member, swore me in. He was also informally attired for the occasion. We toasted the moment with coffee.

Within a few weeks of this career sea change, I was selected for brigade-level command and notified that I would be sent to Germany to take the 42nd Military Police Group in June 1983. Instead of staying at Carlisle a fourth year, I asked to attend a nine-month German language course which was conducted by the Foreign Service Institute of the State Department. The command position required a great deal of work with West German customs and finance officials in all the states and at the federal level in Bonn. It just seemed the right thing to do. The two-week "G.I. German" orientation given to troops arriving in country taught soldiers how to find the train station, how to locate a bathroom and how to order a beer and schnitzel, but not much more.

The language training began in August 1982 and ended in March 1983. In the weeks and months between those two dates, I think my brain was trapped in a monster vise. Every weekday from 8:00 until 1:00, I was in the classroom with a variety of teachers whose German dialects represented different regions of the country. Those women pounded us with conversation drills based on text we had memorized the night before; with vocabulary drills, idiomatic phrases and interminable reviews of what to me were unintelligible rules of grammar. A fellow sufferer likened the process to having a tin bucket placed over his head, with someone banging it with a big stick every few seconds!

We also had a daily language lab for an hour, using tapes and head phones. This was to improve our pronunciation and conversation. At night, at least three hours were devoted to studying. I was totally focused on one goal: pass the oral exams and achieve a competency level of 3:3, which meant that I was at least fairly able to read and speak German. When I reached that goal, my sigh of relief must have been heard all over Washington. It's one thing to take language training as a youngster; it's torture to take on a language like German when you're 53 years old.

The two years in command of the 42nd Military Police Brigade were the two happiest years of my military career. As the first woman to command a brigade-sized unit in Europe, I had a few anxious moments just thinking about what lay ahead. I had no MP training, no MP experience and here I was, taking on a sizable MP group with six detachments spread from Bremerhaven to Nurnburg, and 39 field offices, two of which were in Livorno and Vicenza, Italy. The group's mission spanned the entire European Command (EUCOM). It was responsible for the EUCOM-wide Department of Defense military customs program. It also inspected every outgoing shipment of Army household goods, actively pursued black market operators and those trafficking in drugs, and controlled all narcotics dogs in USAREUR. The group was under the command of the Deputy Commander in Chief (the DCINC) of USAREUR, a two-star general headquartered in Heidelberg. My headquarters was in Mannheim.

The Group provided instruction to all armed forces personnel in Europe who were to be military customs specialists. It had personnel on the scene during every major exercise to insure that soldiers did not return to the United States with contraband of any kind in their possession. Every piece of equipment returning also had to have the Group's seal of approval as being free of unwanted plant or animal life, and free of dirt (which could contain assorted nematodes).

The wartime mission of the 42nd MPs was another matter. Under mobilization, it became the command and control headquarters for all MP assets above corps. Its mission as a theater-level command was control of enemy prisoners of war. That was a huge mission.

For most Army officers, I think that a time comes when you take on an assignment which uses everything of value you have learned through experience, and all the pieces of that puzzle we call a career suddenly seem to fit. That time came for me with the 42nd Military Police Group.

In so many ways, we were the MP stepchildren in USAREUR: a one-of-a-kind group commanded by a woman who had not spent one minute of her time in military police work. From the day I took command, someone with lots of authority was trying to shut the operation down or take the group away from the DCINC. Other MPs neither knew or understood the group's mission and structure. None of them understood that the 42nd MPs and the German government were inextricably linked by our NATO Status of Forces Agreement, and that the Germans looked to the group to enforce the agreement insofar as customs, drugs, the control of rationed items, and USAREUR drivers' rights were concerned. There were some pretty senior people who really thought they could deactivate the group and use its assets for "real" MP work. They learned differently. The work of the 42nd was not only real; it was a vital link between the Army and the West German government.

By the end of my tour in summer 1985, dramatic changes to the group were happening. At the change of command ceremony, the lettered detachments of the group were changed to MP companies with histories, heraldry and numerical distinctions. For the first time, the group was organized in peace as it would be organized in war. Its wartime mission would be given far more attention, and the groups' outstanding soldiers would spend their share of time in the field, preparing for war. Much of this was already being worked on when I took command. My staff did all the work; I ran interference for them, then had the pleasure of seeing it happen.

I was at my laziest in this tour. There was no way I would command so dispersed a group from my headquarters perch. I had to delegate, trust, and get out of the way of the commanders and NCOs who were doing the work. Of course, I traveled around to check on progress, and when necessary, I replaced a few ineffective men or women in the group who kept others from doing their jobs. You will never control any organization unless you relieve it from micromanagement and give it permission to act creatively and decisively. This becomes a matter of trust which, when given, returns far more dividends than Penalties.

Just a word about the 42 MP Group change of command ceremony. Commanders and soldiers came from all parts of West Germany to march in the parade. I cannot describe the sense of pride I felt looking out over the field and seeing every troop standing tall, marching behind the flags of their newly-designated companies. What I remember most fondly, however, is the last element that passed the reviewing stand. It was a platoon of dog handlers and their working dogs, marching right in step and in straight lines. My favorite view of that platoon was from its rear, with all dogs moving out smartly, their tails wagging to the beat of the drum.

In July 1985, my twice-revised retirement plan was in place. I had wrangled a staff position with the headquarters group of the 32d Army Air Defense Command (AADCOM) in Darmstadt. Here, I would prepare family support plans for this widely-dispersed command and then retire in April 1986 with over 26 years of service--six more years that I ever thought I would serve. Once again, however, a telephone call changed those dog-eared plans.

The night I returned from travels throughout Europe with friends, I received a call from my former boss, Major General Tom Ayers. He gruffly "complained" about how hard it had been to reach me, then switched gears and offered congratulations. I had been selected for promotion to brigadier general, a happening which I found very hard to believe. At the age of 55, staring retirement in the face, the last thing I ever thought about was any further promotion. It was miracle enough that I reached the rank of colonel. But it was true. The next morning, I received a copy of the message listing the names of those who had been chosen. The unheard of had come to pass and my impossible career continued.

The months in Darmstadt with the Air Defense Command passed quickly. In March 1986, there was still no word on what my first general officer assignment would be, but this was no surprise. The USAREUR Chief of Staff had interviewed me earlier to find out the type of assignments I might be interested in. Without hesitation, I told him that I wanted to stay in Europe and be an assistant division commander for support, a position no woman had ever filled. This is still the case, unfortunately.

I would have been happy with any troop job, but these are few and far between. Finally in April, word came that I was returning to the Pentagon to once again play the first-woman role. I was to be the Deputy Inspector General for Inspections in the Army's Inspector General Agency. I received this news with strong feelings of ambivalence. No one liked inspectors general. They wore the black hats and destroyed the peace and quiet of commanders wherever they lit. In truth, I wasn't looking forward to being a pariah among my old friends.

On the other hand, Lieutenant General Ross Thompson, the Inspector General (IG), had requested me for the assignment, so I was pleased by his act of faith. I also knew that the nature of Army IG inspections had changed dramatically in the past few years. The "black hat" or compliance type of inspection was out and the systemic inspection was in. Inspectors no longer wrote reams of deficiencies about units, then sent the report to the boss of whoever had been inspected. When problems were found, the IG briefed the unit

commander concerned and his or her staff, then left the IG report with them. The focus was on the nature of problems discovered and what in the system caused them to happen. Individuals who made a mess of things in units that were basically sound did receive counselling, but this was incidental to the process. The important thing was to identify what the deficiencies in the system were and the players who would have to fix them.

In April 1986, just prior to leaving for Washington, Major General Victor Hugo, Commander of the 32 AADCOM, officiated at my "frocking" ceremony. He pinned one of the stars on my shoulder and Colonel Kathleen Devlin, a friend who was the Chief Nurse at the 30th General Hospital in Heidelberg pinned on the other. Being frocked meant that I wore the stars and had the responsibilities of a general officer, but not the pay. That began on August first, the day my promotion was actually effective.

In early May, I returned to Washington to serve on the 1986 Brigadier General Selection Board. The next three weeks proved to me the wisdom of something Lieutenant General Dewitt C. Smith, the Commandant of the Army War College, told me when I was promoted to colonel. General Smith said this was the last promotion any officer received which was based on competence. Any promotion from then on was sheer luck and an accident of timing. He was right.

To select 54 officers for promotion, the board reviewed the files of over 2000 colonels serving on active duty. The repetitive winnowing process to get down to the top 200 files took many long days, including the weekends. Three separate panels of the board looked at and voted on every file. Each of us had our own moments of anguish in reviewing, then discarding as noncompetitive, the files of good friends. The final list of 200 officers was an order of merit list, the top names numbered 1-54. Further checks were made to insure there was no derogatory information in the Army's IG files or criminal investigation files which would force the removal of a selected officer's name from the list. This did happen to several officers who were replaced by the next men in succession. (This board selected no women, although I pleaded the case of two women with superb records.).

In a board such as this, with so many eligible and so few selected, it's almost necessary for any officer to know and have served with some of the members who are on that board. This can backfire, however, as Officers who are unfavorably remembered have little chance of reaching the stars. There may be a better way to do this, but I don't know what that would be. On my board, there were at least a half dozen generals with or for whom I had worked. One of them was General Hugo. I know that made a difference in my case.

When the board ended, I reported to the Inspector General Agency to begin another grand adventure. As part of my orientation, I attended several weeks of classes at the IG School located on the grounds of the Engineer Center at Fort Belvoir. Every Army IG, civilian and military, must attend this course before taking on an inspector's role. When the course is over, military graduates pin on the distinctive IG Insignia which they will wear until their IG detail is finished--a period of three years for most.

As Deputy Inspector General for Inspections, I was responsible for the Army's worldwide inspection program and all technical inspections of chemical or nuclear units. I also had oversight for all Army intelligence programs, to include those that were "black" or clandestine. To do all of the awesome work of the division, there were about 90 colonels and lieutenant colonels, a smattering of majors, a sprinkling of captains, and numerous civilian IGs assigned. Everyone of these people was handpicked for this duty, and their quality was outstanding, with few exceptions. It was no easy task to be senior rater for such a population of quality people.

For two years, I traveled the world in support of our program, trying not to arrive in an area being inspected until the team was just about ready to brief the command. Any briefing was given first to me and after any corrections, to the command group. The team would already have conducted its unit-level briefings. At times, briefing the senior commanders and staffs became heated, but never argumentative. My job was to be the buffer between the IG team and the command, and to make sure that responsibility for systemic flaws was correctly placed. We really meant it when we told commanders we were there to help them.

Analysts who worked for me prepared the annual inspection program, which we then briefed through the inspector general to the Army chief of staff. We also outbriefed every inspection conducted to both the vice and the chief of staff, two men you never wanted to face unless totally prepared. Prior to those briefings, however, the DA staff principal in whose bailiwick the problem lay was given the word.

In these two years, I learned a great deal about how the Army really operates. I also learned that there were those at the top who turned deaf ears when told of problems the field commanders were having with DA's dysfunctional combat exclusion policies. Women soldiers were being whiplashed by conflicting interpretations of regulations and were often denied assignments in units where their skills were not only needed, they were desperately needed. More than one senior commander disregarded DA's rules and assigned women where they were needed regardless of the "P" code. I knew this was being done, and I never reported the incidents. It seemed far more important to get qualified people into critical positions than it was to kill the commander's chance to do just that. Of course, the obvious solution was to correct the policy, but no one did that.

In the spring of 1988, a new assignment loomed for me. The US Army Engineer Center and School at Fort Belvoir was moving to Fort Leonard Wood in June. The two-star command slot would also move with the engineers, and Fort Belvoir would have a one-star commander in the future. I was going to be that commander.

In June, I began this last great adventure in my career. Fort Belvoir was not only changing its mission. It was also changing its parent command from the US Army Training and Doctrine Command to the US Army Military District of Washington (MDW). This would happen on October 1, 1988.

I reported to MDW Headquarters at Fort McNair in Washington, D.C. in late June. The Commander, Major General Don Hilbert, greeted me warmly and gave me a detailed briefing about the position I was going to fill: rather, the positions. In addition to commanding Fort Belvoir, I was also going to be the Deputy Commanding General of MDW.

The plan called for me to move to Fort Belvoir as soon as possible and take charge of the transition from TRADOC to MDW command. Since Belvoir would continue to be a TRADOC post on paper through September, an engineer colonel from TRADOC would be the acting commander until MDW took charge.

With me arriving early, the potential for a few turf battles was evident. I had already heard tales about this colonel and his terrorizing ways. That fact didn't bother me at first. I just wanted no "shootouts at the OK Corral" over policies and lines of authority. We both had our marching orders, and I concluded that he would not pull any stunts which might jeopardize his position after October first. That generally held true, but midway through this transition, I did tell him what I thought of his leadership style. He would change both his attitude and his harsh treatment of subordinates or he would be out on his rear come October.

Just one week into the new tour, General Hilbert had major surgery, and I suddenly found myself the acting commander of MDW. This gave me command authority over the famous US Army Third Infantry Regiment which was located at Fort Myer, Virginia, another of MDW's subordinate installations. I found that particularly satisfying in light of the fact that women could not be assigned to infantry units. (The same delightful thing happened when I was with the Air Defense Command in Germany and was acting commander of that combat command in the absence of General Hugo and his deputy. I heard that USAREUR headquarters was a bit uneasy with this arrangement, but I relished every moment.).

I made a quick study of MDW's various missions during this time of temporary command. The Third Infantry Regiment is the oldest and one of the most distinguished infantry units in the Army. Its troops have the mission of protecting the White House, Congress, all government departments and all of the major players, starting with the president, in the event of an enemy attack. It trains for this and other infantry missions. The regiment is, however, usually consumed by its ceremonial responsibilities, to include mounting an around-the-clock guard at the Tomb of the Unknowns. Every military funeral on post has its complement of regimental soldiers. Wherever any former American president's funeral service is conducted, Third Infantry soldiers will be present. (There is a detailed funeral plan in place for every living former president and for the serving president. Little is left to chance in these documents.).

The Military District of Washington also plans all military aspects of each presidential inauguration. Planning for this event begins more than a year in advance. It is an incredible task and involves a sizable staff headed by a brigadier general. This inaugural task force is responsible for coordinating every facet of this famous event with the White House, Congress and every government department. If there is a "zero defects" mission in the Army, this is it. The mission is particularly difficult when there is a change of presidents, with "new people" who want to run the show.

Additionally, the MDW commander is responsible for Arlington National Cemetery. He commands the US Army Band and Chorus, the Drum and Fife Corps, the Continental Honor Guard and all ceremonial marching units. Davisson US Army Airfield at Fort Belvoir is part of the command, as are Forts Myer and McNair. I believe Fort Meade, Maryland was added to this roster after I left active duty. This is, indeed, another of those "one-of-a-kind" commands.

I'm sure some function or group has been left out, but you get the picture. On any occasion when I assumed command of MDW, I divided my time between MDW headquarters and Fort Belvoir. So much was happening at Belvoir, I was there except for the MDW events I had to cover. I became pretty good at laying wreaths at the Tomb of the Unknowns and at the statue of Simon Bolivar. Actually, I escorted the dignitary who was laying the wreath and insured that proper military honors were rendered. My specially tailored dress uniforms, provided by the command, were worn for all ceremonial events. Some items were unique, such as a dress blue coat with epaulets and general officer dress blue slacks. These were organizational items, but MDW gave me written permission to donate the unique uniforms and overcoat to the WAC Museum. The command had no need for them after I retired.

Once I assumed command at Belvoir, my schedule really became hectic. Fort Belvoir was about to become the Army's largest administrative post. A major move was underway to relocate to Fort Belvoir every possible military unit in the area which was using leased space in privately-owned buildings. The cost to lease was tremendous. In the long run, it would be far less expensive to house a variety of major commands on Belvoir, using vacated engineer buildings and buildings which were yet to be constructed. There were already 76 tenants on post when I took command. This number was going to rise sharply, and soon.

The development plans estimated that our population would grow by 3000 people in the next five years. With 15,000 soldiers, civilians and family members already being served by this antiquated but beautiful installation, the Army would have to pour hundreds of millions into construction, road building and the tremendous upgrade of an infrastructure which was already sagging.

It seemed to me that every thunderstorm meant a power outage which lasted for hours. Most of the sewer pipes had been there for 60 or more years. For the most part, family housing units were old but serviceable. Major upgrade was needed in many of the units occupied by lower grade enlisted personnel, and senior officer homes which were built in the 1930s had wet basements which needed to be waterproofed and roofs which

needed to be replaced. As if this weren't enough, the construction of a new day care center had come to an abrupt halt when the contractor ran off with the Army's funds. This project would be in limbo for many months to come.

Millions alone were needed just to modernize the communications system. Unbelievably, the system still used a central switchboard which should have been donated to the Smithsonian Institute a long time ago. Fort Belvoir could never begin to handle the telephone traffic for all of the incoming units. It wasn't even doing that for its present customers. And automation? Megabucks more.

An early briefing on Fort Belvoir's current and future budget had lit a blazing fire in my soul. It seems that TRADOC's exodus had been an exercise in budgetary rape, pillage and plunder. Funds for the post had been withdrawn, along with a large number of the personnel authorizations. The rationale for this highway robbery was that MDW would be the headquarters to supply both dollars and spaces in the new fiscal year. The problem with that line of thought was that MDW had not budgeted for Fort Belvoir, and there was nothing in the pot for them. The battle to obtain a supplemental appropriation began in earnest. Funds for all development work would come from the Base Relocation and Closure Committee--also called the BRAC. Those funds were entirely separate from the post funds. The dollars my staff and I were chasing were just to meet the civilian payroll, pay for utilities and other essential services.

We had some very interesting groups to deal with in planning the phases of development at Fort Belvoir. First, there were the major new tenants scheduled to move our way: the Army Materiel Command; Information Systems Command; Criminal Investigations Command; the Defense Logistics Agency; the Army Civilian Staff College, and others. Each of these came with their own wish list for space and location.

Then there were Virginia state legislators and members of both Congressional houses; the Fairfax County Board of Supervisors; The Mount Vernon Ladies Association and the Woodlawn Foundation--both concerned with any development which would interfere with Mr. Washington's view from either historic site. There were various citizens groups, the Fairfax County Police, and many, many more.

I kept Virginia's Governor Gerald Baliles informed of what was happening through my membership on the Governor's Military Council. Veterans got the word when I attended the Governor's Board for Veterans' Affairs meetings. Environmentalists bent on saving wetlands and various animals were extremely vocal. Old engineers who were appalled at the fate of their historic home were really irate and needed careful handling. To them, it was bad enough that a woman was now commanding Fort Belvoir, the Corps' home for so many years. Making radical changes to what they had loved was just too much for them.

One meeting I had with members of the Fairfax County Board of Supervisors gave us a bright and shining moment during our incessant debate with others over Belvoir's growth. This board was trying to blame the post for the impossible gridlock on Route One and Interstate 95 every day, all day. These were the two main routes leading to the post as

well as into Washington. The supervisor's were trying to build the case that the Army must pay millions in road improvement costs to offset the pain we were causing the county and its constituents by our growth.

I called this particular meeting and asked the supervisors to come to Fort Belvoir. As predicted, the demand for road improvements was made. We were, however, ready for this. Two weeks earlier I asked my deputy to obtain a set of aerial photographs of Fort Belvoir which would show the relationship of the post to the surrounding communities north to south, east to west. He did just that, with the help of a pilot from Davisson Army Airfield.

The photos were spectacular. They revealed that Fort Belvoir was hedged in on three sides by massive housing developments and a glut of industrial parks. The side not covered was the one we could protect: the Potomac River shoreline on post. Since all of this congestion was in Fairfax County, then the Board of Supervisors was the group that authorized the construction of all those houses and business parks. They were the culprits, not Fort Belvoir. Our meeting with the supervisors ended shortly after we had shared our greatly enlarged photos with them. Fort Belvoir will provide road improvements but only in the areas where our construction projects are taking place. That's only fair.

I wish there had been a way I could have stopped the hands on the clock during that magic year. I knew why command of Fort Belvoir had been given to me. The man who fights to get post command is a rare officer. Men want to control divisions, corps and armies, but a post? Not likely, let the woman do that unglamorous work. I am just glad that I was on the scene when opportunity knocked.

To my way of thinking, nothing is more important than to work in the arena where the quality of life for a soldier and his or her family is anchored. That's at the post where the soldier works, is supported by all of the available services and makes his or her home, single or married. The post commander and staff are the ones who build that quality with the skills they possess and whatever funds they can obtain to make it a better place. It's grueling work: an uphill battle every day for the right kind of support and enough money to just keep your heads above water. But, it is worth every trying minute you plug along to get the job done.

The command of Fort Belvoir--where 25 years earlier I led a female company and would have laughed at anyone's suggestion that I might return some day to command all troops was an ideal final assignment. Not many generals leave while commanding soldiers. I was one of the lucky ones.

I retired from active duty on September 1, 1989. After three false starts and nine years of service which I never expected, I left the profession of arms. It was time. It seemed entirely logical that my impossible career would end with an unbelievable parade: one in which troops from Fort Belvoir, the Third Infantry Regiment, a contingent of them carrying the 50 state flags; the Continental Honor Guard; the Drum and Fife Corps, and the US Army Band honored me by their participation.

The weather was beautiful, and the American flag popped in the breeze. My family and many friends were there to share this occasion with me. Two former directors of the Women's Army Corps, women officers and NCOs with whom I served during the WAC years; soldiers I had known at different stations and in different times: all were there to wish me well as one chapter of my life ended and a new one began. Memories for a lifetime are made on days like this.

Postscript

In this journal, I have spent little time discussing the stresses and strains associated with a soldier's life. They are there in abundance for all men and women who have chosen a military career. Many of the stressors are shared by women and men; some are not. In gender-specific stress, women are the ones who bear the heavier load. Before addressing that, however, I would like to talk about two of the shared sources. Let's begin with the nature of a military career.

The Profession of Arms

Stress is an institutionalized component of the military profession. It begins early and does not end until the soldier leaves the service. The process of applying for any of the armed forces is where it starts: there are qualification tests to take, a physical examination to endure, background checks to pass, decisions to be made about what service, what specialty and training to request. At any of these gates, a person can be stopped. This doesn't include the gates manned by parents or friends who might not want you to take this step. Processing is the first real pressure cooker a soldier endures. Then, basic training begins.

Stress is all encompassing in the training environment, an alien world for most military neophytes. The noise level generated by bellowing, in-your-face drill sergeants is the first blast. Group living with a bunch of strangers is the next. You have to learn an entirely new way of life and a confusing array of skills which a soldier must master if he or she is to survive to move on to more training, more trauma. The process is competitive and will continue to be competitive once training is over.

The military profession is success driven. A soldier must pass through every gate placed in his or her path basic and advanced training; specialized schooling; job performance evaluations, appearance before promotion boards, among many. Then there are the "enhancers:" ranger, airborne, air assault, combat infantryman or combat medic badges or tabs; college education, awards and decorations, ad infinitum. A soldier must move up or move out, into a gentler, kinder civilian world (so he or she hopes!).

The very act of moving from one assignment to another places tremendous stress on a soldier. The military profession demands a high level of mobility of every soldier and soldier family. In my career, I moved a total of 23 times. That's 23 times I packed and moved my household goods around the world to begin a new assignment or attend a school. Damage to my furniture was at times severe, and parts of shipments were lost on occasion, not to be seen again.

Add to this another burden in the same timeframe: the burden of saying goodbye to friends; the burden of finding a new home if quarters on post are not provided; the burden of starting a new job, meeting new people, learning to get around in unfamiliar places, knowing that once more, you have to prove yourself. Moving takes its toll. Throw in the stress that moving places on the family, with children dreading that first day at a new school; with wives or husbands setting out once more to find a job. Each move becomes harder than the one before. By the time I reached move #23, I hated the sight of dish packs and book boxes. The thrill of the unknown was gone.

The very real possibility of death or injury is inherent in every soldier's career. In this decade alone, soldiers have fought and died in Desert Storm operations, in Somalia, in Haiti and in Bosnia. Their contracts of unlimited liability tell them that other operations will take place, and other soldiers will be killed in combat or as the result of some operational accident. The threat of death or maiming by any of the one million mines placed in Bosnia is reality for those serving there.

Today, Army downsizing has caused the Army's strength to plunge to its lowest level since before the Second World War. There is tremendous pressure on every career soldier to stay in shape, make no mistakes, accept whatever assignment is handed out, endure repeated deployments to strange and foreign lands, and to perform a peacekeeping, nation building or combat mission. A volunteer's will to stay the course is being constantly eroded by such pressures, by the very real assaults on his or her retirement benefits and by the frequently diminishing quality of life experienced on any number of installations. It is not a pretty picture for our troops.

Soldiers and Their Families

The Army of "no horse, no wife, no mustache" is a relic of the past. Today, we have the most married Army in our history, and this is not going to change. At least, it will not change as long as ours is a volunteer force.

While being married and being a soldier are not mutually exclusive, being both of those individuals in one is a difficult undertaking. Stressors surround the soldier, his or her spouse and any children they may have. Unquestionably, healthy families greatly enhance the quality of any soldier's life. Day to day complications which arise between the soldier, the unit and the family's needs can normally be worked out with teamwork and cooperation on the part of all the players. This happens most of the time.

In recent years, a new trend seems to have emerged in some families. This usually involves a spouse who has a well-established career and children who are in their final high school years. These family members do not want to move; many of them do not. They remain in place while the soldier takes on his or her new assignment. Such soldiers are "geographical bachelors" without the family present.

Unhealthy families are something else. The stress in homes where adults are fighting or even worse, where verbal or physical abuse is evident, is a particularly virulent form of stress. Every family member is affected. The bad scene at home will eventually show up in the unit. A soldier's performance begins to slide, and people in charge have to learn what the problem is. If there are children in school, their performance may also begin to plummet. Tempers are short and emotions are raw. If command intervention and marriage counselling do not get things tracking properly, something is going to give. In such cases, the marriage may well be on its way to dissolving: a sad solution but one which is far better than the onset of rage and violence which can quickly escalate.

Most Army commands have gone to great lengths to address the family's needs when soldiers must deploy. The soldier and his or her family depend on those who stay behind to insure that services will continue to flow to the family. The separation is stressful enough. Having to deal with family difficulties over long distances is intolerable for those affected. Yet, many of these services are being curtailed because money and spaces are just not there.

All military parents must have child care plans in place which truly assure that their children will be cared for properly in case of their deployment. This is especially important for sole parents. Deployments come with short notice. There have been horror stories about minor children being left to fend for themselves when their soldier-parent deploys without having a care provider in place. In most instances, the careers of such soldiers crash and burn when this happens. It's evident up top that they can't handle the two roles at the same time.

In deployments, even soldier-sole parents who have made solid, workable arrangements for their children are frequently plagued with guilt about leaving their kids with someone else for the "selfish reason" of pursuing their careers. For any parent, it's never an easy thing to do.

The Woman Soldier and Stress

Women who choose to be soldiers are walking on a road less travelled by most of their sisters. In doing this, they guarantee the fact that, at points along the way, their careers and the careers of men who serve with them will diverge. In saying this, I am not talking about divergence which occurs when men and women who belong to different corps or branches go separate ways to meet their own special schooling or assignment needs. In such instances, the men and women *within* the corps or branch should be traveling together most of the time.

The career divergence I refer to is that which takes place for one reason only: gender. My own career reflects a great amount of divergence which happened because I am a woman. As a member of the Women's Army Corps, my gender was the necessary prerequisite for every WAC assignment. The WAC duties I performed were for the purpose of recruiting, training, commanding or advising other women in the Corps. For the most part, our mission was self-perpetuation, and in those years when we were so few in number, this was how we endured within a much larger and far more powerful Army of men.

Survive we did, to be players in the process which led to our greatly expanded role in today's Army. Yet, despite the disestablishment of the WAC, the more complete integration of women into the mainstream of our profession and the equalization of most policies governing how men and women soldiers are utilized, gender differences continue to have a negative impact on Army women. Consequently, women cannot yet be all they are capable of being in today's Army. The frustration associated with that fact is considerable.

The debate concerning the soldier roles women will or will not play continues. Barriers remain in place which prohibit the assignment of women to the combat arms. This is a matter of policy, not law, and the policy flies in the face of actions taken by Congress in 1991 to purge gender discrimination from Title 10 of the US Code. By doing this, Congress, then the Secretary of Defense, created for Navy women the right to serve on combatant ships and to fly tactical aircraft. Women of the Air Force, who could train Air Force men to fly but could not themselves be used as "real world" combat pilots, also gained the opportunity to be trained for combat air roles if they qualified.

Army women aviators began flying the Apache and Attack helicopters, a policy change made in view of what the Navy and Air Force had done. The Army women aviators cannot, however, be full-service "chopper" pilots. They cannot be assigned to aviation units which provide direct support to combat units.

I am telling you this for one reason, and it is this: to highlight what happens when men and women are not equally free to compete for every Army job based on merit, and only merit. Gender should never be the principle determinant; merit, together with the prerequisite level of physical fitness and the demonstrated ability to meet every standard are what any applicant, male or female, must possess.

As long as the Army maintains gender constraints on key MOS, male soldiers who perform duties in those "protected" MOS will consider female soldiers to be second class soldiers. This marginalization of Army women creates an atmosphere in which sexual harassment, to include sexual discrimination, will flourish if senior leaders do not take the necessary strong measures to prevent it.

When military men and women equally share the dangers inherent in their profession, the attitude of the men toward the women changes for the better. Women become buddies or partners, not second class soldiers. This makes a great deal of difference, especially in an Army woman's sense of acceptance.

The practice of using gender as a disqualifier must end. Merit alone should determine which men and women will serve in any MOS. I know that our readiness will improve if or when we let water seek its own level. This is the best way I can imagine to reduce a woman's stress in this man's world.

No one denies that there are real differences between the sexes. No one expects a time will ever come when military men and women will resolve all the conflict in their relationships. But then, that just happens to be the nature of things.

The military women with whom I have served over the years all seem to want just one thing: to be judged on the merit of their soldiering skills and on their record of performance. Nothing more, nothing less. Military men can make that happen. For the sake of readiness, I hope they will.

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II

Utilization of Women in the Military: Neurocognitive, Psychosocial, and Cultural Factors

**Sex Differences in Cognitive Function:
Implications for Military Assignments**

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Sex Differences in Cognitive Function

Introduction

There have been recent directives to integrate female personnel into an increasing number of military occupations. These directives have led to considerable discussion concerning the fitness of women to fulfill the requirements of certain of these occupations. The aim of this report is to review the evidence for sex differences in cognitive abilities, to indicate factors that may moderate these differences, and to suggest additional information that would be required before informed decisions could be made about occupational assignment on the basis of sex. A related issue concerns the effects of stress and trauma on purported cognitive differences between the sexes. There are few research studies bearing on this issue, and it may be difficult to generalize from the findings of extant literature to the military situation. The necessary research studies will become evident, however, and will be considered at the conclusion of this report.

At the outset, it should be emphasized that with cognitive function, as with most biological traits, there is great variability, and a considerable degree of overlap, between the sexes. As will become apparent in the following review, individual variability is often much greater than the differences between the sexes. In fact, group differences rarely amount to as much as one-half of a standard deviation (a measure of variability), so that the overlap in the distribution of male and female scores is much greater than the separation between them. Moreover, results based on group differences constitute only a general statistical statement; they establish a mean from which any individual, male or female, may differ.

A related issue has to do with the magnitude of reported differences in cognitive function between the sexes. Some studies have reported male superiority in certain aspects of spatial ability on the order of 20% (e.g., Petersen, 1976). A more meaningful measure is the *effect size*, defined as the difference between groups divided by the standard deviation. Effect sizes of less than 0.50 are not considered substantial, and most cognitive differences between the sexes fall far short of this value (Kimura, 1992). Small effect sizes may have relevance to theories of sexual dimorphism in the brain; however, it is not evident that such small differences would have a measurable effect on the actual performance of any well-practiced skill, or on any task requiring a combination of skills, of the type required in military operations.

Furthermore, it is not clear that laboratory-assessed skills are necessarily a valid predictor of job performance. Such "ecological validity" may need to be established in more naturalistic, job-related contexts. Thus, there are complexities that need to be considered in interpreting the findings of research studies on sex differences in cognitive function; and special complexities may arise in applying these findings to military situations.

Sex Differences in Cognitive Abilities

Measures of Performance

An extensive literature exists on differences in cognitive abilities between the sexes. Major sex differences in cognitive function appear to lie in patterns of ability rather than in overall levels of intelligence. The consensus of findings, which has emerged from many investigations, is that men and women have unique cognitive strengths. Men tend to excel on certain spatial tasks. Specifically, men perform better on tests that require spatial rotation or manipulation. They outperform women on tests of mathematical reasoning and in navigating through a route, and have greater accuracy on tests of "target-directed" motor skills, i. e., throwing or catching a ball. In contrast, women tend to excel at rapidly identifying matching items, or "perceptual speed." They have been shown to have superior verbal fluency, including the ability to find words that begin with a specific letter or fulfill some other constraint. Women also outperform men in arithmetic calculation, in recalling landmarks from a route, and in certain precise manual tasks, such as placing pegs in a peg board. In contrast to these "male-favoring" and "female-favoring" tasks, "neutral" tasks are those on which there are no sex differences. Neutral tasks include general intelligence measures, such as vocabulary, and verbal and non-verbal reasoning tests. Reviews of studies reporting these findings have been published by Halpern (1986), Jarvik (1975), Maccoby and Jacklin (1974), and Tyler (1965).

There is, however, some controversy as to the size and extent of sex differences in cognitive abilities (Feingold, 1988; Hyde & Linn, 1988; Linn & Petersen, 1985). In fact, some of the more recent literature, particularly on sex differences in visual-spatial skills, provides evidence of so many exceptions to the general rule that there appears to be no simple generalization with respect to any visual-spatial skill on which males excel.

From an intuitive point of view, it seems reasonable to assume that visual-spatial skill may be especially salient for the performance of numerous military-related tasks (e.g., sighting weapons, reading maps, visualizing terrain with respect to the deployment of resources, etc.). Consequently, findings of research in this realm will be considered in some detail.

Spatial visualizing ability was identified by Thorndike as a unique human skill, not subsumed under general intelligence, as early as 1921. This type of cognitive ability may be defined, as in the study by Linn and Petersen (1985), as "skill in representing, transforming, generating, and recalling symbolic, nonlinguistic information" (p. 1482). When defined in this way, it is clear that a range of cognitive abilities may be subsumed under the general rubric of visual-spatial skills. Studies reviewed below have shown that there is no uniform superiority of male over female subjects in this cognitive realm.

Some of the complexities in generalizing the findings of male-female differences in visual-spatial skill are illustrated in a classic study by Petersen (1976). In her investigation, archival data from a developmental investigation showed that male 18-year-olds performed significantly better than female 18-year-olds on a test of spatial ability (the Space subtest of

the Thurstone Primary Mental Abilities Test); the difference between the two groups was on the order of 20%.¹ However, the difference between groups was noticeably smaller than the variability within either group of subjects; thus, 1 out of 6 of the 18-year-old females performed better than the average of the 18-year-old males. Consequently, the expected male group superiority on this test of spatial ability may have little meaning with respect to the performance or capacities of any individual woman.

A meta-analysis published by Linn and Petersen (1985) highlighted further difficulties in generalizing about sex-related differences in visual-spatial skills. In their review of 127 articles published between 1974 and 1982, they adopted the technique of calculating standardized, unbiased estimates of the magnitude of differences in performance on spatial tasks between male and female subjects. This permitted the authors to compare and contrast the results of many studies that employed differing methodologies. Linn and Petersen categorized spatial abilities into three types of skills: spatial perception, mental rotation, and spatial visualization. Their meta-analysis revealed that sex differences are not found on all measures of spatial ability; whereas males consistently and uniformly outperform females on tasks of mental rotation, only relatively small but consistent differences favoring males (ranging from 0.25 to 1.0 standard deviation) are seen on measures of spatial perception. Moreover, the superiority of the males on mental rotation is reflected primarily in measures of response speed; the data suggest that there are no sex differences in error rates. It may be that females simply adopt a more cautious strategy of performance. In contrast, few consistent sex differences were seen on tests of spatial visualization, where "the average effect size did not differ from zero" (p. 1490).

Of particular relevance for the present discussion is an earlier finding by Petersen (1976) that female adolescents rated on the basis of physical characteristics as having lower levels of estrogen tended to excel in spatial abilities. This finding raises the question of whether women who seek traditionally masculine occupations within the military are a representative sample of the female population. If there exists within the military a subgroup of women with above average spatial skills, then generalizations about male-female differences in cognitive skills may have even less relevance to service personnel. Research is needed to establish whether military women as a group are more likely to fall within the 16% who exceed the average male in performance of spatial tasks, in accordance with the findings of Petersen. As we will show below, the results of other studies have raised further complexities, as they indicate that the male superiority in spatial ability is true in only limited circumstances.

Petersen (1976) used physical measures of secondary sex characteristics, such as muscle/fat ratios, overall body shape, genital or breast size, and distribution and amount of pubic hair, to estimate the degree of sex hormone development in the subjects. Later research assayed testosterone levels directly by a plasma-based radioimmunoassay technique, as in the study by Shute, Pellegrino, Hubert and Reynolds (1983). A variety of

¹It is of interest that the same female subjects did not show evidence of the expected advantage in verbal fluency at age 18, although they were superior to their male cohorts at ages 13 and 16. This illustrates the importance of a dynamic rather than static perspective on sex differences.

measures of spatial orientation and spatial visualization were utilized. As shown in Figure 1, the results indicate that there was a double dissociation between sex and testosterone level: high-testosterone males performed *worse* than low-testosterone males on these spatial tests, whereas high-testosterone females performed *better* than low-testosterone females. In fact, it is evident from the figure that high-testosterone females performed *better* than high-testosterone males on this test of complex spatial visualization. The potential relevance of data of this type to the assignment of military tasks is clear.

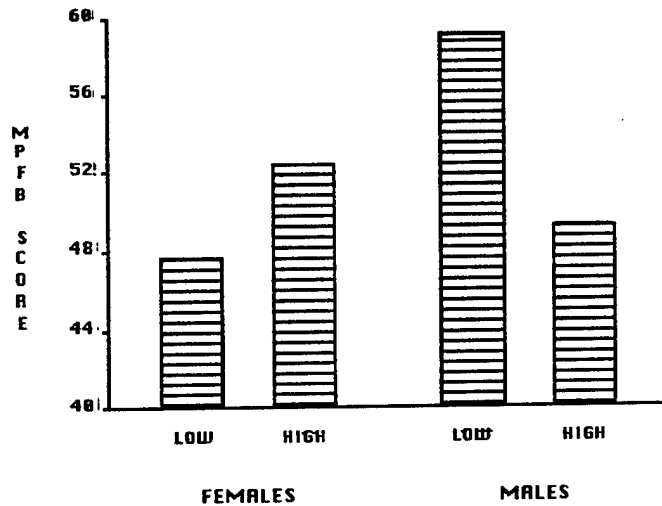


Figure 1. Mean scores on a spatial processing task as a function of sex and level of testosterone within each sex. The finding of an interaction between sex and testosterone level was replicated in subsequent research (Gouchie & Kimura, 1991). Level of testosterone was not found to relate to performance on female-favoring or neutral tasks. From Shute et al. (1983).

In a recent extension of this study, Gouchie and Kimura (1991) compared performances on a variety of "male-favoring," "female-favoring," and neutral tasks in groups of men and women. As expected, large differences in testosterone level were found between the male and female subjects. Men were found to outperform women on two of the male-favoring tasks, Mental Rotation and Mathematical Aptitude; no other significant differences in performance were observed. However, as in the case of the Shute et al. (1983) study, there was a significant interaction between sex and hormone level: Low-testosterone men were superior to high-testosterone men on the spatial "Paper Folding" task, whereas high-testosterone women surpassed low-testosterone women. A similar pattern, though nonsignificant, between testosterone level and the performance of men and women was observed in the Mental Rotation and Mathematical Aptitude tasks. This was seen as well in a composite score based on average standardized scores on male-favoring tasks. These findings led to the conclusion that there is an optimal level of testosterone for maximal spatial ability, a level that falls in the low male range (Berenbaum & Resnick, 1982; McKeever, 1986; Petersen, 1976).

Measures of Event-Related Brain Potentials

Event-related brain potentials are a reflection of the brain's electrical response to sensory or cognitive stimulation. Electrical currents generated by populations of neurons responding synchronously to synaptic activation are recorded on the scalp, where they are seen as voltage oscillations or components. Components are labeled for their polarity (positive or negative) and latency following stimulus onset. For example, P300 is a positive wave occurring approximately 300 msec after a stimulus is delivered. The shorter latency components (e.g., P50, N100) are thought to be primarily exogenous because they are more dependent upon physical characteristics of the eliciting stimulus. In contrast, the later components (e.g., N200, P300) are thought to be primarily endogenous, as they vary in amplitude and latency in relation to the individual's evaluation of the significance of the stimulus rather than its sensory qualities. In general, the shorter the latency of a component, the less sensitive it is to variations in the subject's attention.

There have been a number of research studies assessing sex differences in sensory and cognitive processing, as indexed by event-related potentials. Studies of the sensory and cognitive components will be discussed separately.

Sensory components. Beagley and Sheldrake (1978) reported shorter latencies of brainstem auditory evoked responses² in a group of 35 female subjects as compared with a group of age-matched males. The ages of these healthy subjects ranged from 14 through 79. Allison, Wood, and Goff (1983) conducted a comprehensive investigation of sex- as well as age-related differences in auditory, visual, and somatosensory event-related potentials. In their adult subjects, the latencies of all components were significantly earlier in the females than the males. These differences were explained by sex differences in head size and, for somatosensory event-related potentials, by sex differences in arm and shoulder dimensions. The finding of significant sex differences in the latencies of sensory components (shorter in women than in men) has been replicated in numerous studies (e.g., Dehan & Jerger, 1990; Stockard, Hughes, & Sharbrough, 1979); however, these differences are considered to reflect only average physical size differences between men and women.

Cognitive components. Polich (1986) compared the P300 component, believed to be related to stimulus encoding activity and to reflect the amount of attention accorded to the eliciting stimulus, in 50 male and 50 female college students. No statistically significant differences were found in the amplitude or latency of the P300 elicited in a simple auditory discrimination task. There was, however, a trend for the female subjects to have somewhat larger amplitudes than the males, a difference that reached statistical significance in a subsequent study (DiTraglia & Polich, 1991). Deldin, Duncan, and Miller (1989, 1994) reported that the P300 elicited in auditory and visual discrimination tasks was shorter in latency and larger in amplitude in women than in men. The reported difference in the

²Brainstem auditory evoked responses, first described by Jewett and Williston (1971), are a measure of the electrical signals generated in the subcortical auditory structures, from the eighth nerve through the brainstem nuclei, to the auditory cortex. They are elicited within 10 msec of an auditory stimulus.

latency of P300 is consistent with sex differences in head size (affecting neural transmission time), whereas the difference in amplitude is consistent with differences in the thickness of the skull.

Thus, as in the case of sensory components, there appears to be no evidence for systematic sex differences in electrophysiological indices of cognitive processing that cannot be accounted for in terms of differences in anatomy.

Performance Under Stressful Conditions

The broader question concerns whether some cognitive skills are especially susceptible to the effects of stress or trauma. The narrower issue, in the present context, concerns whether sex-related cognitive abilities are likely to be differentially affected by stressful conditions, and, further, whether these effects are more likely to be observed in men or in women.

A major concern has to do with the nature of the stress, whether induced in the laboratory, or assessed under real-life conditions. There are limits in the extent to which laboratory studies can duplicate conditions of combat or other stressful military operations. The laboratory can only approximate realistic conditions of fatigue, exertion, sleep loss, and boredom (not to mention wounding and witnessing the injury or death of comrades) that exist during military operations. Commonly utilized techniques for inducing stress under laboratory conditions involve exposing the subject to photographs, films, or sound recordings that depict the results of accidents, mutilation, or sexual activity (e.g., Horowitz & Becker, 1973; Horowitz & Wilner, 1976). Less traumatic manipulations have also been utilized, including requiring the subject to perform difficult tasks for long periods of time or to undergo simulated or real examinations. It is not clear the extent to which information generated using such methods generalizes to the military situation. However, studies of cognitive performance during military operations (including combat) are likely to be uncontrolled and of somewhat dubious scientific value, with the possible exception of operations in which the planning has included opportunities for systematic and controlled observations.³

³Combat would seem to provide an extraordinarily difficult circumstance under which to gather information about cognitive performance, although debriefing after the event may possibly yield anecdotal information of some value. Some data have been gathered about the cognitive characteristics (mostly measures of general intellectual capacity) of Israeli soldiers who were awarded decorations for bravery during combat, in comparison to a group of non-medal winners from the same units, matched on rank and military specialty (Gal, 1983). No differences were found between the medal winners and the controls on measures of general intelligence, social intelligence, or emotional stability. Differences were found only in personality measures such as devotion to duty, decisiveness, and perseverance under stress, all of which were rated higher in the medal winners. Gal concluded that under the extreme stress of combat, situational variables had a greater effect on an individual's behavior than personality variables. Because women are not used in combat roles in the Israeli Defense Forces, there are no data on their

There is scant published literature on the specific topic of sex-related differences in the effects of stress on cognition; the few published studies are reviewed below. However, there have been many studies concerned with the increased susceptibility of women to affective as well as other, physical disorders. This work may have some relevance to the goal of this review, in that the prevailing theories speculate on female susceptibility to the effects of stress. Two types of explanations have been advanced to account for this difference; one is based on social-psychological factors, the other on biological factors.

Social-psychological factors in the development of disorder were reviewed by Kessler, Price, and Wortman (1985). They noted that some researchers have attributed the greater prevalence of affective disorder in women to the stress produced by their disadvantageous role in society. Other factors that have been mentioned are the increased stress resulting from the supportive, care-giving role of women, and the increased empathy they display, thus placing them in a more vulnerable position when faced with the loss of friends and family members. In contrast, however, women adapt better than men to divorce, widowhood, and loss of financial support.

Biological explanations have been advanced more recently to account for the greater prevalence of affective disorder in women. Thus, there is some evidence of sex differences in the sensitivity of the hypothalamic-pituitary-adrenal axis, the major central nervous system mechanism for responding to stress (Gallucci et al., 1993). In this study, healthy women showed a significantly greater pituitary-adrenal response to a corticotropin-releasing hormone than healthy men. Moreover, the elevation in cortisol was more prolonged in women than in men. Gallucci et al. speculated that this difference might underlie the increased prevalence of certain stress-related disorders in women.

Hellhammer and Wade (1993) also hypothesized that sex differences in the pituitary-adrenal response to stress may be significant, and suggested that specific tests of endocrine responsiveness might serve as markers of vulnerability to the development of psychosomatic disorders. As will be seen below, however, not all investigators have found greater corticosteroid responses to stress in women than in men (Collins & Frankenhaeuser, 1978).

It is not known if the factors, whether social-psychological or biological, involved in the differential susceptibilities to affective disorder also result in male-female differences in the effect of stress on cognition (i.e., independent of disorder-related cognitive deficits); this is the subject of future research. The few available published research studies on the differential effects of stress on cognition in men and women are reviewed below.

Experimentally-induced stress. The general consensus in this area is that there are no substantial differences between men and women in the effects of stress on cognitive performance. However, the definition of "cognition" used in this research is a broad one, comprising such measures as estimates of anxiety, hostility, and depression, rather than performance on objective tests of attention, memory, or problem-solving. Furthermore, some of the reports suggest that although the end result is the same, women may use

performance under these conditions.

different mechanisms than men to cope with stress. That is, the subjective experience of stress for women may be greater than that for men, but they appear to have developed cognitive measures to cope with stress and reduce its effects on performance.

One of the earliest of these studies was conducted by Horowitz and Becker (1973), who showed films depicting subincision of the penis (to generate negative emotional arousal) or sexual intercourse (to generate positive emotional arousal) to male and female college students. No differences were found between the groups in the tendency for intrusive thoughts to impinge on subsequent ratings of affect, mental content, or performance on a signal detection task. Similar results, using a similar experimental approach, were found by Cysewski and Weiner (1975). These investigators used tape-recorded accounts of an automobile accident or of a final examination to induce, respectively, imagined physical or mental stress. There were no sex differences in the subjective ratings of degree of emotionality induced by the stressors; however, the female subjects tended to express their emotional responses more openly and to achieve higher scores than the males on their ratings of mental stress.

The suggestion of greater affective response by female than by male subjects was borne out by the results of a study by Neufeld (1978), who compared the effects of imagined as opposed to direct confrontation of stressful events in male and female subjects. Measures included rating scales and questionnaires, as well as heart rate and galvanic skin response. Whereas no sex differences were found for the imagined situations, females showed more evidence of a stressful response to the direct confrontation. Neufeld concluded that the female subjects responded more strongly to the direct stressor, generated increased cognitive coping efforts, and thereby reduced their subjective stress to the same level displayed by the males.

A more recent report on this topic (Tolkmitt & Scherer, 1986) bears a strong similarity in interpretation of results to that of Neufeld (1978). Tolkmitt and Scherer compared the effects of mild stress (viewing photographs of skin disease) and high stress (viewing photographs of severe accident victims) on quantitative measures of speech production (phonation and articulation) in male and female students, who were in turn subdivided into three groups (low anxiety, high anxiety, anxiety-denying). Significant stress-induced changes in speech were manifest only by the high anxiety and anxiety-denying women.

Collins and Frankenhaeuser (1978) studied the effects of performance of a cognitive-conflict task under conditions of distraction in male and female engineering students. Male subjects showed a greater increase than female subjects in adrenaline secretion during the stress condition, whereas the opposite was true for changes in heart rate. Males expressed greater feelings of effort and involvement during the stressful task, and had a significantly larger increase in cortisol excretion, but there were no significant differences in performance between the sexes.

Clinical studies of stress. In these investigations, the effects of real-life stressors, either chronic or more situational, are assessed on broadly-defined measures of cognition. In the first of these studies, Hood, MacLachlan, and Fisher (1987) attempted to

ascertain why women have poorer scores than men on the Cognitive Failures Questionnaire (or CFQ). They examined the relationships among sex, CFQ scores, and a measure of psychoneurotic symptoms. Poorer scores on the CFQ among women were associated with higher neuroticism scores. The authors suggested this apparently greater vulnerability to stress among women accounts for the sex differences in cognitive failures. However, before this conclusion could be accepted, the study would need to be replicated using more refined measures of cognitive function and neuroticism.

The realistic stresses associated with the internship year in physicians were assessed among 27 interns in a study conducted by Ford and Wentz (1984). Performance on tests of reaction time and critical flicker fusion, as well as symptoms of depression, were measured on a regular basis during the internship year. No deleterious effects of the inevitable chronic sleep loss were reported for either sex on the performance measures. Although anger increased progressively during the year, the only sex-related difference was an increased tendency for the female interns to become more depressed. However, the incidence of depression for the group as a whole was low. The results of this study are also consistent with the findings of other studies discussed above, suggesting that women may either experience or express more effects of stress than men. However, these effects will probably not be manifest in performance because of the coping strategies adopted by women.

A comprehensive survey of the effects of self-reported stress on neuropsychological function was conducted by Laursen (1990). The subjects comprised 519 females and 507 males, ranging in age from 30 to 60 years, who were administered a computerized battery of neuropsychological tests. The battery included measures of learning and memory, visuomotor and visuospatial function, concentration, perception, attention, and vigilance. Among other measures was a seven-item stress questionnaire, comprising the symptoms of sleep loss, fear, nervousness, irritability, fatigue, nausea, and stomach rumble. A total of 60% of the female subjects as compared with 40% of the male subjects reported at least one symptom of stress. Laursen found some variation in the performance of males and females on the tests, reflecting the expected differences on male-favoring versus female-favoring tests (cf. Gouchie & Kimura, 1991). Stress produced impairments in sustained attention and concentration, but no differential effects of stress were observed in men versus women.

Summary

The consensus of findings of numerous investigations of sex differences in cognitive function is that there are differences in patterns of ability rather than in overall levels of intelligence. For many cognitive characteristics, including general intellectual capacity, verbal and nonverbal reasoning, and vocabulary, no consistent sex differences exist. For other cognitive capacities, there are significant sex differences, although the average difference between men and women is very small as compared with variations among men or women (Levy & Heller, 1992). Specifically, men, on the average, excel on tasks involving spatial rotation and manipulation and mathematical reasoning; whereas women, on the average, excel on tests of verbal fluency and articulation, perceptual speed and

accuracy, and manual dexterity.⁴ The review has also pointed out the marked degree of overlap between male and female performances, the relatively small effect sizes for most of the tasks that have been used, and the paradoxical effects seen in men and women with high levels of testosterone. Thus, women with high testosterone levels outperform women with low testosterone levels on certain male-favoring tasks, whereas men with low testosterone levels outperform men with high testosterone levels on these same tasks.

These sex differences in cognitive function have not been found to be reflected in measures of sensory or cognitive event-related brain potentials. However, the critical studies, in which the tasks used to elicit the brain potentials tap sexually differentiated skills, remain to be done.

Whereas there is some indication that women may experience or express stress differently from men, no measurable sex differences in the effects of stress on cognitive function have been demonstrated. Definitive conclusions, however, await additional studies using objective and sensitive measures of attention and performance as well as stressors with ecological validity.

Hormonal Influences On Cognitive Function

Organizational Effects of Sex Hormones: The Sexually Dimorphic Brain

Despite the numerous reservations and caveats concerning the robustness of the concept of sexually-dimorphic skills, there has been a substantial body of research aimed at describing the differential effects of male and female hormones on the development of the brain. There are, indeed, substantial differences between the naturalistic behaviors of male and female animals; examples of these include copulatory behavior, nest-building, care of the young, play behavior, aggression, and defense of territory. A concise review of the research with special relevance to human cognition was provided by Kimura (1992).

The general principle seems to be that "the effects of sex hormones on brain organization occur so early in life that from the start the environment is acting on differently wired brains in girls and boys" (Kimura, 1992, p. 119). Animal studies have shown that there are basically two processes, a prenatal masculinization effect, mediated by estrogen and dihydrotestosterone, and a postnatal defeminization effect mediated by estrogen (Goy & McEwen, 1980). In the absence of dihydrotestosterone, the default condition of the

⁴Even these conclusions may be oversimplified, in that the relation between sex and cognitive ability pattern has been shown to vary with hand preference and level of general reasoning ability (Harshman, Hampson, & Berenbaum, 1983). Thus, for example, for subjects with above-average reasoning ability, the spatial skills of left-handed males are reduced but those of left-handed females are raised, relative to their right-handed counterparts. The opposite pattern is found for subjects with below average reasoning ability. Verbal fluency, perceptual speed, and visual memory were also shown to interact with sex, handedness, and level of reasoning ability.

brain is not neutral, but feminine; thus, rats who would otherwise have developed into males display feminine copulatory as well as other behaviors when deprived of the masculinizing hormone. In humans, girls exposed to excess androgen in the prenatal or neonatal stage (because of adrenal hyperplasia or steroid treatment of their mothers during pregnancy) have been found to have superior performance on a variety of male-favoring tasks (Money, Schwartz, & Lewis, 1984).

These unusual circumstances aside, it is the case that competence in spatial tasks is normally influenced by levels of male and female sex hormones, and their effects on the development of specific regions of the brain (Nyborg, 1983). Spatial abilities are conditioned by testosterone and estrogen levels over the course of maturation, and capacities (in the case of women) may fluctuate during the menstrual cycle on the basis of the rise and fall of estrogen levels. As we will see below, normal variability in hormone levels, within both men and women, is correlated with measurable variation in spatial abilities.

There are relatively few anatomical differences between male and female brains. Differences have been reported in the preoptic area of the hypothalamus (larger in male than in female rats and humans) (Gorski, 1990), in the thickness of the posterior portion or splenium of the corpus callosum (thicker in women than in men) (de Lacoste-Utamsing & Holloway, 1982), and in the comparative thickness of the right versus the left cerebral cortex (more of a right > left difference in male than in female rats) (Diamond, Dowling, & Johnson, 1981; Stewart & Kolb, 1988). Kimura (1992) also described differential effects of cerebral vascular accidents in male and female patients, with females more likely to display aphasia and apraxias following anterior (vs. posterior) lesions, and males more likely to show such syndromes following posterior (vs. anterior) lesions. Earlier research by Lansdell (1962) reported greater cognitive effects of temporal lobe surgery in male than in female patients who had undergone unilateral resections for intractable epilepsy.

Although the differences that have been described thus far between male and female brains are relatively slight, they may form the basis for the differences in skill between men and women. In a somewhat different vein, Kimura (1992) speculated that evolutionary specialization may account for the differences between male and female skills. As hunters and warriors, men needed to have superior long-distance route finding as well as targeting (right cerebral hemisphere?) abilities. In contrast, as food gatherers, food preparers, and child caretakers, women needed to have fine motor abilities and the capacity to attend to small changes in the environment (enhanced communication between the cerebral hemispheres?). Others have also speculated on the evolutionary significance of the "activational" effects of variations in estrogen levels (Silverman & Phillips, 1993).

Variations Across the Menstrual Cycle

There exists a belief that a woman's mood, and her ability to perform cognitive tasks, vary directly as a function of her menstrual status. The term for this construct, premenstrual syndrome or "PMS," has been used as a rationale for "women's performance debilitation, lability of mood and general unreliability during the menstrual and

premenstrual phases of the cycle" (Ussher & Wilding, 1991, p. 532). PMS, as noted by Ussher and Wilding, is a rather vague and loosely defined syndrome with over 150 possible symptoms, and with little evidence for its reliability or validity. Nevertheless, PMS has been used as a legal defense in a number of cases of female violence.

The question therefore arises as to whether or not the period immediately preceding and during menstruation is in fact an interval of high stress for women--and as a consequence, a time of emotional lability and impaired judgment and cognition. If this were the case, military commanders should be reluctant to entrust female personnel with responsible or demanding assignments during the premenstrual or menstrual phase of their cycles. This would likely result in the exclusion of otherwise qualified women from responsible military assignments, including combat, and serve to hinder their rise to command positions in military service.

Measures of performance. There have been a number of investigations of the effect of menstrual cycle on performance, as well as on affective state and degree of arousal. The question of the effects of menstruation on cognition was probably the first to be investigated in a rigorous way (e.g., Sommer, 1983). The consensus of the results of these studies is that there is no detectable effect of menstruation on cognitive performance.

Other investigations have concerned whether *any* parts of the menstrual cycle are associated with consistent variations in cognitive ability. The results of studies bearing on this question are mixed; some researchers have concluded that there are no consistent alterations of behavioral and/or electrophysiological measures of cognitive capacity during any phase of the menstrual cycle (Fleck & Polich, 1988; Kluck et al., 1992; Ussher & Wilding, 1991; Walsh, Budtz-Olsen, Leader, & Cummins, 1981). Other researchers have reported consistent and replicable changes in performance on specific tasks in relation to menstrual phase (Hampson, 1990; Hampson & Kimura, 1988; Robinson & Kertzman, 1990; Silverman & Phillips, 1993).

Kimura and Hampson have reported consistently, in a series of papers, that there is a significant interaction between task performance and menstrual cycle phase (Hampson, 1990; Hampson & Kimura, 1988; Kimura & Hampson, 1994). Their initial study (Hampson & Kimura, 1988) reported that a group of 34 women performed significantly better on certain female-favoring tasks during the high estrogen (mid-luteal) phase of their cycles than during the low-estrogen (menstrual) phase. In contrast, they performed significantly better on male-favoring tasks during the menstrual phase than during the mid-luteal phase of their cycles.

These findings were confirmed and amplified in a subsequent investigation (Hampson, 1990), in which over 50 women were studied. Estrogen, progesterone, and luteinizing hormone levels were confirmed by radioimmune assays, and women with abnormal values were excluded from the study. The tasks in which performance improved during the menstrual phase included the Rod and Frame and Hidden Figures tests, both male-favoring, each of which involve a cognitive operation in visual space. The reciprocal effect (better performance on female-favoring tasks during the high estrogen or mid-luteal phase) was seen in tests of manual speed and verbal articulation. Other findings included

an enhanced right-ear advantage in a dichotic listening task during the high estrogen phase of the cycle. The results were unrelated to mood changes associated with hormonal variations.

Silverman and Phillips (1993) reported a series of four interrelated studies of the relation between menstrual cycle phase and scores on male- and female-favoring tasks. A consistent finding was that women's performance on a three-dimensional mental rotation task was significantly better when estrogen levels were at their lowest. This effect was seen in both oral contraceptive users and non-users, but not was evident in control tasks (i.e., Digit Symbol or anagrams test) or in a spatial task that did not require mental rotation.

In the studies described thus far, periods of high estrogen were always associated with periods of high progesterone (the mid-luteal or preovulatory phase of the menstrual cycle). Robinson and Kertzman (1990) designed their study of hormone effects on attention to attempt to parcel out the effects of estrogen and progesterone. They tested women close to day 10 of their cycle (in which progesterone is relatively low and estrogen relatively high) and close to day 25 (in which progesterone is relatively high). No assays were used, but the authors tried to exercise quality control by excluding women on birth control pills, and by careful monitoring of the regularity of the subjects' cycles. The task involved several cued attentional paradigms, with the cue varying in the amount of information it provided about a subsequent target location. On high progesterone days, women performed significantly faster on all paradigms than on high estrogen days. In addition, on high progesterone days, they were able to overcome the effects of a "diffuse" (non-informational) cue--as measured by reaction time--to a greater extent than was possible on low progesterone-high estrogen days. The investigators concluded that focal attention is enhanced by high levels of progesterone and reduced by high levels of estrogen. In view of these results, it is a question of some interest as to whether focal attention may be a male-favoring skill.

Turning to the question of menstrual cycle effects on performance under non-laboratory conditions, Walsh et al. (1981) investigated the effect of menstrual phase (menstrual, pre-menstrual, luteal, and mid-follicular) on examination scores in a group of 244 medical and paramedical students. Both final examination and other examination scores comprised the data base. Included among the questions addressed was the effect on examination scores on days when the subjects were, by self-report, suffering severe menstrual discomfort. None of the analyses showed significant effects of menstrual cycle on examination scores.

In a more recent experimental study, Ussher and Wilding (1991) measured the performance of 10 women on a battery of computerized tests; these were administered to the subjects nine times during one menstrual cycle. The tests included semantic processing, tracking, visual search, and digit span. In addition, skin potential and heart rate measures were obtained on each of these occasions, as well as self-reports of degree of stress and arousal. Hormone levels were not assayed. At least one test session was conducted during each of six menstrual stages. Subjects entered the protocol at different stages. Ussher and Wilding found no change in state, as measured by skin potential level or heart rate, or in overall performance, within the cycles of the 10 subjects. Only a modest

improvement in semantic processing was seen in the premenstrual stage; and increases in arousal, as indexed by skin potential and self-report, were seen in the latter half of the cycle. The authors concluded that no substantial changes in cognition can be detected over the menstrual cycle, that previous studies reporting such findings were poorly designed, and that if there are any negative cognitive changes, e.g., at the time of menstruation, women may be able to compensate for them by dint of additional effort. This may be reflected in the measured increases in some aspects of arousal.

The issue of repeated measurements (nine administrations of the test battery within one 28-day interval), with the inevitable confounding effects of practice, boredom, or both, seems not to have been considered by the authors. Nor did they attempt to utilize any of the established male- or female-favoring tests described by Hampson and Kimura (1988).

Measures of event-related brain potentials. Three studies of the effects of menstrual cycle on the P300 component of the event-related potential have been reported. Fleck and Polich (1988) studied the P300 elicited in a standard auditory oddball task on the first (assumed to be low estrogen) and fourteenth (assumed to be high estrogen) days of the cycle. The subjects comprised 20 adult women with regular menstrual cycles. No differences were found in the amplitude or latency of P300 between the two menstrual stages.

Results similar to those of Fleck and Polich were reported in a more comprehensive study by Kluck et al. (1992). A complex visual discrimination task with easy and difficult targets was used; six subjects were tested weekly for five weeks. Their menstrual stage (as determined by levels of luteinizing hormone, estradiol, and progesterone) was measured initially from blood samples. Later in the study, the blood analysis was replaced by urine dip sticks, which were used to measure the surge in luteinizing hormone associated with ovulation. There was a nonsignificant trend for an increase in P300 amplitude to the difficult targets in week 4 (premenstrual), but no statistically significant changes in reaction time to easy or difficult targets over the five-week period.

In contrast to the findings of Fleck and Polich (1988) and Kluck et al. (1992), Johnston and Wang (1991) observed a significant change in P300 amplitude as a function of menstrual phase. The reason for the positive result seems to relate to the use of affective stimuli (e.g., pictures of babies, male and female models, dermatological cases). The amplitude of P300 elicited by pictures of babies and male models was larger when progesterone levels were high in comparison to times when testosterone and estrogen levels were high. Different groups of normal women were used to assess the peak effects of the three steroid hormones.

The results were interpreted as support for the view that the P300 component reflects the subjective importance of the stimulus, in addition to its subjective probability. "Importance" is thought to vary with the cognitive and biological state of the organism.

Variations Across the Seasons

Seasonal variations in cognitive abilities is a relatively new area of research and stems in part from cognitive changes observed in persons with seasonal affective disorder (Rosenthal et al., 1984). Such persons suffer regularly from depression as the period of daylight is reduced in late autumn, and may remain clinically depressed until spring, when the period of daylight increases substantially. One of the primary clinical symptoms of this disorder is a cognitive change--reduced ability to concentrate--which dissipates as the depression lifts with the return of spring. This striking clinical syndrome has provided one rationale for investigating the effects of seasonal variations in cognitive abilities (e.g., Deldin et al., 1989, 1994; Kosmidis, Duncan, & Mirsky, 1996; Polich & Geisler, 1991). An additional rationale is provided by the knowledge that there are fluctuations in testosterone level in males over the seasons; the question naturally arises as to whether the level of performance of male- or female-favoring skills would also fluctuate seasonally.

Measures of performance. Although men are not subject to the mensal fluctuations in hormone levels seen in women, they are subject to seasonal fluctuations in testosterone, with maximal levels occurring in the autumn and minimal levels in the spring (Reinberg, Smolensky, Hallek, Smith, & Steinberger, 1988). Recently, Kimura and Hampson (1994) reported data from an ongoing study in which they found seasonal variations in cognitive performance in men, with enhanced performance by males on male-favoring tasks (Mental Rotation, Hidden Figures, Paper Folding) in the spring. The results suggest that optimal performance on spatial tasks in men occurs when the level of testosterone is in the low normal range, in agreement with the findings of Shute et al. (1983). No effects of seasonal fluctuations in testosterone level in these men were seen on female-favoring tasks (i.e., measuring aspects of perceptual speed) or on neutral tasks (e.g., vocabulary, Raven's Progressive Matrices, tests of inferential reasoning). Seasonal effects on performance were not observed in the female subjects in this study.

Measures of event-related brain potentials. In a cross-sectional (between-subjects) study of seasonal variations in event-related potentials, Deldin et al. (1989, 1994) reported that P300 was larger in summer and winter than in spring and larger in women than in men. Moreover, P300 was observed to be more sensitive to the effects of season in women than in men. Other sensory or cognitive components of the event-related potential did not vary as a function of season. Polich and Geisler (1991) replicated the finding of seasonal fluctuations in P300 and reported that P300 was larger in summer than in spring or winter and larger in women than in men. The increased sensitivity of women, as compared to men, to seasonal influences on P300 was also seen in a longitudinal (within-subject) investigation (Kosmidis et al., 1996). However, P300 was maximal in winter and minimal in the summer in both the male and female subjects. The investigators ruled out seasonal fluctuations in photoperiod and speculated that information processing may be challenged by the harsh environmental conditions of winter and result in increased allocation of cognitive effort and resources. Such increased allocation of resources would be reflected in augmented P300s.

Summary

When the methods of the studies reviewed above are compared, it would appear that there may actually be no discrepancy between the results of those who have found no measurable variations in cognition over the menstrual cycle and those who report significant and reliable variations. Part of the answer would seem to lie in the selection of tasks, and part may concern the design of the research. The abilities that appear to be sensitive to menstrual cycle effects are those that have shown reliable sex differences, either male-favoring (e.g., specific aspects of visual-spatial ability, as well as mathematical reasoning) or female-favoring (e.g., perceptual speed, verbal-articulatory skills, and manual dexterity). Moreover, poorly-designed studies that do not take into account the effects of repeated administration of the same test battery contribute little. The phenomenon of sexually differentiated skills appears to be quite robust, as does the phenomenon of fluctuations in ability over the course of the month or the year. New research to further our knowledge in the area of male-female differences in skills must take these two phenomena into account. The possibility exists that differences in event-related potential components over the menstrual cycle or across seasons may be discovered, if the tasks used to elicit the components tap into gender-sensitive cognitive skills. Moreover, timing of the test sessions should coincide with maximal and minimal levels of sex hormones.

Although there may be disagreement as to whether or not there are reliable fluctuations in cognitive ability over the course of the menstrual cycle, there appears to be a consensus that the size of such changes is small, and probably unremarkable in most situations--especially with tasks involving a medley of skills or proficient skills. As Hampson (1990) concluded,

the variations in performance seen in this study over the menstrual cycle tended to be small in magnitude and, therefore, for most women, would go unnoticed in everyday life. . . . Many previous studies have failed to detect significant changes in academic or intellectual achievement over the menstrual cycle This may be particularly true for complex tasks requiring a number of different abilities that may be differentially affected by hormones, or for tasks that are well-practised or rehearsed. The major importance of these findings lies in their theoretical, rather than their practical, implications. (p. 108)

The implication of these findings for military assignments also appears to be clear: they provide no reasonable, practical scientific basis for the exclusion of women from any occupation.

Summary and Conclusions

Précis of Studies Reviewed

A number of themes have emerged from the literature discussed in this review, and they will be summarized briefly.

The first concerns gender-favoring abilities. There are skills in which there is male superiority in performance, those in which there is female superiority, and those which appear to be gender-neutral. The male-favoring skill that has probably been investigated more than any other concerns the processing of information in the visual-spatial realm (i.e., mental rotation of three-dimensional objects, paper folding, and targeting or apprehending missiles). Among the female-favoring skills that have been investigated extensively are perceptual speed, verbal-articulatory ability, and fine motor skills. There are gender-neutral skills as well, including general intellectual ability, verbal and nonverbal reasoning, and vocabulary.

Surprisingly, perhaps, in view of the sex differences in cognitive abilities, no such differences have been reported in event-related potentials that cannot be interpreted in terms of differences in head and body size. It is likely, however, that the tasks used to elicit event-related potentials in these studies were not sufficiently challenging or gender-sensitive to reveal sex differences.

A second theme that has emerged is that there appear to be so many exceptions to the general rule of male superiority in the visual-spatial realm (conditioned by the specific nature of the task and the state, particularly hormonal, of the individual male or female subject) that gender-favoring generalizations may have no relevance to the skills or performance of any individual person at any given time.

The third theme is related to the issue of the effects of stress on cognitive abilities in men and women. Although there are some data suggesting that women may have a greater response to stress than men, other research suggests that women have developed cognitive strategies to overcome the stress. Yet other studies have failed to find sex differences in the response to stress. Thus, it must be concluded that there are no significant sex differences in the effects of stress on performance. Most of the research has involved laboratory analogs of real-life stress, employing either simplistic or questionable measures of cognitive abilities. Consequently, the applicability of this research to the military situation is limited.

The fourth theme is that there are mensal fluctuations of cognitive skills in women, with enhancement of female-favoring skills at times of high estrogen levels (with concomitant degrading of male-favoring skills) and degrading of female-favoring skills at times of low estrogen levels (with concomitant enhancement of male-favoring skills). However, the onset of menses does not coincide with any detectable impairment of skills. There is some research suggesting that there are periodic testosterone-related fluctuations in the performance levels of men, as well, although the period appears to be circannual (i.e., autumn versus spring) rather than monthly.

The fifth theme, and the one whose importance may override all the others, is that the differences in the performance of cognitive tasks between men and women are small and that the variability among individuals is great. Moreover, although the periodic fluctuations in performance in men and women are statistically significant, their import may be more theoretical than practical (i.e., relating to the effects of sex hormones on the sexually-dimorphic brain). Thus, the periodic fluctuations in cognitive skills may not be measurable

in everyday life: they may be overcome by practice and/or they may be embedded in a complex task such that fluctuations in any component skill may be undetectable.

Although the evidence is incomplete, the tentative implications of this review of the literature for the performance of women in military occupations, including combat, is the following: there are currently no scientific grounds for concluding that women do not possess the requisite cognitive ability to execute any and all military assignments.

Stress and Combat: A Question of Relevance

As noted in the review, there has been very little research on the differential effects of stress on cognitive functions in men and women. It was noted, as well, that the stressors used have been relatively mild, comprising such manipulations as taking examinations, or in more extreme cases, showing films of mutilation.

We have also noted that these stressors are undoubtedly considerably less severe than those entailed in actual combat. The question arises, therefore, as to whether laboratory conditions can ever emulate realistic conditions of combat. Moreover, as we noted earlier, assessments of cognitive function made during conditions of combat may be of limited scientific value because of the poor observational conditions, as well as the effects of stress on the participants as well as the observers. Such conditions are not conducive to systematic observation.

On reflection, however, it is not evident how salient an assessment of the cognitive effects of combat in men and women is to the mission of the military. It is probably the case that promotion to the highest ranks is much more difficult in the absence of combat experience, and that excluding women from combat experience sets limits on their promotion potential. This thorny issue notwithstanding, the possible differential cognitive effects of combat in men and women need to be evaluated in relation to the amount of time such activity occupies in military life.

Although all recruits are trained to use weapons, and have at least basic training for combat-related activity, combat is an unusual event. Even for troops whose mission is primarily combat, the percentage of time spent engaging the enemy is relatively small. Therefore, whereas it may be necessary to discover whether men's and women's cognitive skills are affected differentially by the stresses of combat, the more important question, statistically speaking, is the differential effects of stress on men and women performing noncombat duties. Thus, it would appear to be more relevant and provide more useful information to the military to evaluate possible sex differences in the performance of cognitive tasks under such stressful conditions as boredom, fatigue or sleep loss, extreme cold or heat, or other suboptimal environmental circumstances.

Caveats: Expectations, Stereotypes, and Prejudice

The research that has been reviewed represents, with the few exceptions that were noted, the performance under laboratory conditions of well-practiced, well-rested subjects, selected for their ability to cooperate, and tested under conditions free of coercion or prejudice. The typical research protocol, as mandated by Institutional Review Committees, assures subjects that they are free to terminate the experiment at any time without incurring any penalty or disfavor. This type of research atmosphere promotes the acquisition of valid and reliable information and yields maximal performance levels. It is this type of research environment that has led to the conclusion stated above, albeit tentative, that there are no scientific grounds for concluding that women do not possess the requisite cognitive ability to execute any military assignment.

However, the conditions of military training may be far from the ideal seen in the laboratory. Thus, if on the basis of sex-stereotypic beliefs, female recruits are seen by their instructors as inferior, incapable, or ineffective, that evaluation may be readily communicated to others. Moreover, the expectations of inferior performance may be accepted by the recruit as well, and lead to lower levels of accomplishment, regardless of innate abilities. We speculate that, in some instances, the innate skills of female military personnel may thus be subverted by the sex-stereotypic beliefs of their superiors. In any event, if instructors view women as inherently inferior to men on some or all military tasks, it will be more difficult for them to perform to their full potential and thus to convince their instructors otherwise.

Directions for Future Research

Considerable research data already exist concerning the basic, functional, cognitive equality of men and women. Nevertheless, additional studies need to be done to provide full, fair, and unbiased information concerning the possible unique contributions that men and women can make to military life. The following areas, identified in this review, need further exploration:

1. The circadian, monthly, and circannual effects of sex hormones (and other endocrinological and biological factors) on cognitive functioning in men and women. The basic cognitive skills investigated should include, but not be limited to, attention, memory, and problem solving as well as established male- and female-favoring skills.

2. The effects of common stressors on the performance of cognitive skills, as well as on military activities in male and female personnel. Such realistic stressors include boredom, fatigue, sleep deprivation, heat, cold, and possibly high altitudes. The basic cognitive skills investigated should include, but not be limited to, attention, memory, and problem solving as well as established male- and female-favoring skills.

3. The characterization of men and women in terms of their typical interests, skills, capacities and, possibly, sex hormone levels, and the effects of such variables on attention, memory, and problem solving as well as on established male- and female-favoring skills.

4. Studies of possible sex differences in cyclic variations of event-related brain potentials, using gender-sensitive tasks and affective stimuli to elicit brain potentials.
5. Research on possible sex differences in attentional function, particularly as affected by cyclic variations in sex hormones levels.
6. Controlled, naturalistic observations of the cognitive performance of male and female military personnel under actual training or field conditions.
7. Studies of the attitudes of military instructors concerning the cognitive abilities of male and female recruits, using independent assessment of these abilities as well as measures of the possible effects of these attitudes on the performance of the recruits.

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Women in Green: Attitudes and Opinions

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Attitudes and Opinions

Introduction

This chapter presents the attitudes and opinions of women in the Army, primarily with respect to three areas of Army life: their jobs, careers, and families. Since our goal is to present aspects of these domains not as isolated phenomena, but in a broader context, the attitudes and opinions of both male and female soldiers are presented, and the differences, as well as the similarities, are highlighted. We also identify some of the factors which influence women's and men's perceptions of Army life in each of these three areas.

We recognize that political concerns often arise when males and females are compared and we acknowledge the feelings of some that this type of research should be discouraged (e.g., see discussion in Eagly, 1995). However, looking at attitudes and opinions can help dissolve stereotypes in those cases in which there are no actual differences, yet differences are often anticipated or accepted without question. In addition, such analyses can help foster an understanding of the influential factors when such differences do occur.

Our focus here is primarily on research conducted within the last 5 years. We have drawn upon several types of research, including: published articles; studies commissioned by the Department of the Army; large-scale, Army surveys; and individual and small group interviews with soldiers conducted by the authors during this period. The data from these sources have provided critical information to both Army policy makers and research communities.

We begin this chapter by discussing **Army jobs** and considering the environment in which soldiers' work is performed. Here we discuss gender-integrated basic combat training, a relatively recent innovation in the Army, stressors associated with life in Army units, and attitudes held by women and men on the presence of females in combat. In our next section, **Army careers**, we discuss the organizational commitment, limitations to upward mobility, and mentoring. Our final section is titled **Army family life** and it is here that we explore the intersection between work lives and family lives and the extent to which coping with the multiple roles of soldier, spouse, and parent is a source of stress and conflict for all soldiers, and for Army women, in particular. The attitudes expressed throughout this paper illustrate the multiple, complex sources of stress that impact on Army careers, in general, and the additional unique stressors that affect women in the Army. We conclude with a discussion of stress as a theme which runs through all of the issues presented and point to some of the implications of our findings for understanding women in green.

Army Jobs

Gender-Integrated Basic Training

Until recently, Basic Combat Training (BCT) for combat support (CS) and combat service support (CSS) soldiers was conducted in single-gender companies. However, in

1993, the Army began to experiment with gender-integrated companies. Research on the performance, morale, cohesion, and commitment of soldiers in single-gender and gender-integrated companies were collected and analyzed. The research was divided into two phases. Phase I occurred in the summer and fall of 1993 and Phase II took place during the summer of 1994. The companies were characterized by the following gender compositions: (1) all male, (2) all female, (3) gender-integrated with 50% male and 50% female, and (4) gender-integrated with 75% male and 25% female.

The results showed that there were few performance differences between soldiers in the various conditions. For example, there were few differences in the training performance of soldiers in all male companies and of those in gender-integrated companies. Also, most soldiers, irrespective of the gender composition of the company, agreed that they were proud to be in the Army. Finally, the findings in Phase I corresponded to those in Phase II. Thus, males who were in all male units in Phase I had similar assessments of cohesion, teamwork, and morale as males who were in gender-integrated units in Phase II.

However, Mottern and Simutis (1994) do note some important gender differences. Females, in general, were more positive than males about gender-integrated training. Overall, it appears that gender integrated training had a generally positive effect on female soldiers. This was illustrated by the fact that females in gender-integrated units were more positive than females in single-gender units about their training experience and reported higher levels of cohesion and teamwork. In fact, females in single-gender units appeared to have had the least positive training experience of all. These findings suggest that gender-integrated training has a definitive positive effect on women and that such training is not associated with significant declines in performance, cohesion, and teamwork among men. These experiments resulted in the Army subsequently instituting gender-integrated BCT for CS and CSS soldiers (Mottern & Simutis, 1994).

Women in Army Units

The role of women in the Army has been a topic of considerable debate over the years. A series of Army experiments were conducted in the late 1970s which were designed to determine the level at which the presence of females in a unit would 'degrade' unit performance. Similar experiments were later conducted on units participating in Return of Forces to Germany (REFORGER) exercises. To the surprise of many, these experiments, known respectively as the MAX-WAC and REF-WAC studies, demonstrated that the presence of women in units was not associated with lower unit performance. Holm (1992, p. 401) sums the findings this way:

It was found then that women generally performed their tasks as well as men and that any unit degradation was negligible or statistically insignificant. That was not what the Army had expected to find.

More recent data, however, show that females and males continue to hold divergent perceptions about whether women and men perform comparably in their units. In particular, some males believe that females do not, nor are expected to, work as hard as

men. Females disagree. For example, significantly more women than men said that in their unit, male and female soldiers perform equally well in their assigned tasks (APSO, 1994b).¹ Among officers, 88% of females versus 78% of males said that both genders worked equally well. There is an even greater gap between female and male enlisted personnel on this issue; 80% of females versus 60%, of males said that both genders performed equally well. Further evidence of this gender difference, is that only 10% of all Army females as compared to 40% of all males agreed that female soldiers were not required to work as hard as male soldiers. Although the data do not specifically indicate that men think women's performance is at a lower level than theirs or that they believe women are assigned easier tasks, this data and anecdotal evidence from other sources (see, for example, Mottern & Simutis, 1994) suggest that some men do, in fact, feel that women receive easier assignments and do not perform as well as men.

Womens' roles. More recently, in a discussion of the role of women during Operation Desert Storm, Holm (1992, p.xiii -xiv) notes the multiplicity of roles in which female soldiers were engaged.

Of the 540,000 Americans who served in Desert Storm, nearly 41,000 were women - more than 7 percent of the U.S. forces in the theater. It was the largest wartime deployment of American military women in history. They did just about everything on land, at sea, and in the air except engage in actual fighting, and even there the line was often a fuzzy one.

Indeed, Army women are performing in a wide array of Military Occupational Specialties (MOS) and in a variety of unit types. In recent years, there is some evidence that resistance to the presence of women in units is waning. Although there continue to be distinct gender differences, nevertheless, the majority of Army females and males (77% versus 62%, respectively) agreed that women should be assigned to any specialties for which they can pass a test to qualify. And, 40% of Army males agreed that having both genders in a unit improves the work atmosphere of the group. Another 31% of the males expressed neutral views on the issue (APSO, 1994b).

An additional concern of the Army has been the extent to which males would accept females in command positions. However, a minority of male soldiers surveyed in 1994 actually expressed negative sentiments about having a woman in command. Only one in five males said that if more women were placed in command positions, the effectiveness of the Army would go down, and only one in six males said that it was more difficult to take orders from a soldier of the opposite sex (APSO, 1994b).

Working environment. Downsizing over the last 5 years has significantly affected the working environment of units throughout the Army. Soldiers indicate they are being required to do more with less as a consequence of downsizing. Army personnel also

¹ These data are from the Sample Survey of Military Personnel (SSMP), conducted by the Army Personnel Survey Office (APSO). The SSMP is administered every spring and fall to about 6,000 Army personnel in the ranks of private through colonel. Information on the SSMP is available from APSO upon request.

find they must cope with the stress associated with long hours, unpredictable jobs, and tight resources. Additional data show that over 90% of Army leaders surveyed agreed that doing more with less had increased the stress soldiers feel on the job. Similar proportions of both female and male leaders reported that, because of limited resources, the soldiers in their organization were working longer hours to accomplish their mission (69%) and that as the Army becomes smaller they will be expected to work even longer hours (about 89%). Thus, it is clear that most Army personnel, irrespective of gender, are working longer hours under very stressful conditions.

When asked how much their work schedule interfered with other aspects of their job or life, females and males again responded quite similarly. Both indicated that, during the last three months, their work schedule frequently or almost always interfered with their job productivity (about 12%) and with their ability to get sufficient sleep (16%). However, females and males did have different responses to questions on the length and predictability of the work day with more males reporting disruption from their jobs. Considerable proportions of soldiers reported that, during the last three months, they were frequently or almost always required to work longer than normal duty hours (43% of females and 53% of males). And, although 43% of the females could predict at the start of the day when they would be getting off duty, only 36% of the males could. These findings may, in part, reflect the different branch assignments of females and males. The greater likelihood that males will be assigned to combat units, and the unpredictability associated with such units might explain these differences. However, we have seen few studies reporting Army job predictability which have compared unit assignments and would, therefore, sort out these apparent gender differences.

Long, unpredictable work hours could be expected to influence soldiers' self-reports of the stress they are feeling at work and at home. And, in fact, a high percentage of soldiers (about 40%) said that they were experiencing high to extremely high levels of conflict or stress in their military jobs. About 25% also said they were experiencing high levels of conflict or stress in their family/personal life (APSO, 1992a). Other data on stress (which asked soldiers to report separately on family stress and personal stress) showed that, among company grade officers, although there were no gender differences in the amount of job and family stress reported, more females than males reported high levels of personal stress (Harris, 1994).²

Perceptions of the equity of treatment in the unit may be yet another stressor in the work environment. In 1994, over 80% of all soldiers said that males and females were equally encouraged to succeed, and that soldiers in their unit worked well together, regardless of their gender. There are, however, indications that some soldiers perceive that females are treated differently in the units than their male peers. Specifically, males and females hold differing perceptions regarding the way work is assigned and the expectations

² The Longitudinal Research on Officers Careers (LROC) is a longitudinal survey administered in 1988, 1989, 1990, and 1992, to company grade officers selected from year groups 1980 to 1991. LROC contains data on over 10,000 officers, of which 928 have responded to every administration. This research is described in greater detail in Harris, Wochinger, Schwartz and Parham (1993) and Harris (1994).

for performance. Although most females (over 75%) report that females and males in the unit are given equal kinds of work, and that females and males in the unit are expected to achieve the same standards, fewer males (65%) agree (APSO, 1994b).

Women in Combat

Assigning women to combat units has long been a hotly debated issue and, in recent years, has received additional attention from both the military and civilian communities. The Presidential Commission on the Assignment of Women in the Armed Forces (1992) was convened to reconsider the roles of women in combat in light of the recent experiences of both men and women deployed to Southwest Asia as part of Operation Desert Shield/Storm. Male and female Army personnel hold vastly different opinions on whether women should be in direct combat and the consequences of such gender integration. Although men may express less resistance to the presence of women in combat units than they expressed in the past, many men still believe women should not be in combat. Half of all male soldiers disagreed that women could make just as good front-line soldiers as men if they were given the same training; yet, 40% of the female soldiers agreed that women could make as good front-line soldiers as men. Women and men even have different views of the consequences of the combat exclusion policy. For example, considerably more females than males (43% versus 22%, respectively) said that women cannot advance as quickly as men in the Army because certain combat areas are closed to women (APSO, 1994a; APSO, 1994b).

Data from the fall of 1994 show that fewer female soldiers than male believed the current combat exclusion policy should be left as is. Specifically, among officers, 23% of females versus 54% of males, thought the policy should remain unchanged. Among enlisted personnel, 29% of females as compared to 42% of males, thought it should not be changed. In contrast, almost 3/4 of female enlisted soldiers and officers said that the combat assignment policy should be changed in some way. About half of the females indicated that they wanted the combat exclusion policy to be changed so that both males and females could be assigned to combat units only if they volunteered (APSO, 1994b). Currently, male soldiers can be involuntarily assigned to combat units based on the needs of the Army.

Clearly, women and men disagree on women's role in combat. Reasons for these divergent opinions may lie in attitudes about women's physical and emotional efficacy in hostile situations. To explore the reasons behind soldiers' attitudes on women in combat, several questions were asked to understand the issues more completely. Fewer females than males agreed with the four statements in Table 1.

It is important to note that although fewer females than males agreed with these statements, few males also agreed that "women don't have the mental toughness to be effective in a combat situation." These data suggest that many men harbor reservations about the efficacy of women in combat. Furthermore, many male soldiers appear to believe that the assignment of women to combat roles will reduce the efficacy of male soldiers. Despite these varied gender differences on the role of women in combat, 86% of

all soldiers, irrespective of gender, say that their career plans for staying in the Army would not change if women were allowed to be assigned to direct combat (APSO, 1994b).

Table 1

Percentage of females and males who said they agree with four items about combat.

Questionnaire Item	Officers		Enlisted	
	Females	Males	Females	Males
Men may compromise their combat effectiveness to protect female soldiers in combat situations	24	56	35	54
Women don't have the physical strength and stamina to be effective in a combat situation	17	49	20	37
Compared to men, fewer women have the "killer instinct" and will be hesitant to take a life in combat.	14	34	22	42
Women don't have the mental toughness to be effective in a combat situation.	3	15	12	24

In the many years of debate over the combat exclusion policy, there have been concerns that removing the exclusion policy could dramatically affect the distribution of soldiers in the various Army branches and that large proportions of women would flood into combat arms branches. Research suggests, however, that lifting the policy may not precipitate massive transfers of females into combat arms branches. In 1992, about one-quarter of female enlisted personnel and officers indicated they would volunteer for a direct combat specialty if given the opportunity to do so (APSO, 1992b). In another study, company grade officers were asked what branch they would choose if there were no limitations on branch selection. Female and male responses to this question approximated the distribution across arms (combat arms, combat support, combat service support, and special branches) that actually existed at the time of the survey (Harris, 1994). It appears that females may want the combat exclusion policy to be lifted to provide equal opportunities for all soldiers, but not necessarily because they, themselves, want to be in combat arms units. In many ways, female attitudes may be very similar to male attitudes when it comes to branch choice. In short, like their male peers, all female officers do not necessarily wish to be in combat arms units.

Job Satisfaction

Despite the difficulties expressed by female soldiers and the reports regarding gender-based discrimination and constraints on upward mobility, data consistently show that overall job satisfaction is similar for both women and men. In fact, the data suggest that there are considerably more similarities than differences between the genders regarding many aspects of jobs. Army women and men differed little in the extent to which they reported overall job satisfaction and satisfaction with: the amount of enjoyment from their job, level of job fulfillment and challenge, use of skills and training on the job, level of recognition for accomplishments, level of competence of supervisors and the amount of time they were separated from family. In contrast, females did report less satisfaction than males with the quality of leadership at their place of duty, and fewer females agreed that Army leaders would make the best decisions to maintain a quality Army (APSO, 1994b).

Findings for company grade officers support that males and females are very similar in their level of job satisfaction; about 70% report they are satisfied with their job. In addition, job satisfaction remained very stable from 1988 to 1992. This is somewhat remarkable considering the downsizing that has taken place over the last 5 years. In contrast, the percent reporting career satisfaction declined from 60% in 1988 to about 50% in 1992. And, unlike satisfaction with aspects of the job, there are gender differences on a number of career issues (see the next section, below).

Summary

We have noted that although women and men hold divergent views on some aspects of work in the Army, both are working in a stressful environment and they do share some attitudes and opinions about their work. Women and men both report:

- (a) similar feelings of cohesion and teamwork, and demonstrate comparable levels of performance while in gender-integrated training,
- (b) working long hours as a result of downsizing,
- (c) comparable amounts of job interference,
- (d) high levels of stress, and
- (e) satisfaction with their jobs.

Men and women report very different opinions about the role of women in combat. In addition, there are some smaller gender differences regarding the extent to which men and women report that they:

- (a) have to work longer than normal duty hours,
- (b) experience job predictability, and
- (c) believe that women are treated differently in the unit.

Army Careers

Perceptions of Limited Upward Mobility

The glass ceiling refers to the phenomenon in which women and minorities are blocked from attaining the highest levels in an organization (Glass Ceiling Commission, 1995). Glass ceiling studies have often addressed the issue by comparing those who were promoted with those who were not and/or by analyzing the factors associated with upward mobility (or conversely, career stagnation) and determining the extent to which these factors are the same or different for women and men (see, for example, Morrison, White, & VanVelsor, 1992).

Another way to examine constraints on women's upward mobility is to explore the reasons why certain women who do get promoted and appear to be on the fast track, still decide to leave the organization. Just such a study was conducted by the authors of this chapter. This study examined one group of 41 female officers, consisting of captains who had been approved for promotion to major and newly promoted majors, both of whom volunteered to accept a monetary bonus and leave the Army.³ From the Army's perspective, these females were not at risk for involuntary separation. Quite the contrary, they were being rewarded with a promotion which should signal that they could stay in the Army. The findings from this study provide insight into the factors women (and men) take into consideration when making Army career decisions.

Identifying these factors was especially important in light of military leaders' heightened awareness of issues such as gender-based discrimination, sexual harassment, and barriers to female promotions (U.S. General Accounting Office, 1990; U.S. Merit Systems Protection Board, 1992; U.S. Department of Labor, 1992; Presidential Commission on the Assignment of Women in the Armed Forces, 1992). Additionally, these findings help explain the seeming inconsistencies between the Army view and the female officers' actual considerations.

³ In 1992, the year this study was conducted, monetary incentives to leave the Army were being offered to some soldiers as part of the Army's downsizing process.

Interviews with these female officers and with male company grade officers (who were not leaving the Army at this time) indicated that both groups considered many of the same factors when making their decision to stay in or leave. Both male and female officers assessed their competitiveness for future opportunities based on their previous and anticipated assignments, their past and likely future performance ratings, feedback from their branch assignments officer, the experiences of their peers, and the career uncertainty and limitations they anticipated as a result of downsizing. In addition, both males and females considered family issues (such as starting a family, the impact of frequent moves on spouse and children, and having adequate time with family) and monetary incentives (such as receipt of an exit bonus or the potential for higher earnings in civilian sector employment) when making their decision.

However, there were several factors which were specific concerns only for the female company grade officers who had decided to leave the Army. Specifically, they were concerned that the valued operational or tactical assignments (which typically lead to promotion and which were not necessarily combat assignments) were not open to competition for females. These women felt that females were not considered for certain kinds of non-combat jobs because senior leadership considered these jobs "male" assignments. Also, about half of these female officers mentioned experiencing or being exposed to gender-based discrimination. Such discrimination ran the gamut from male leaders expressing negative attitudes about women (e.g., "women don't belong in the Army") or being unwilling to be briefed by a female, to career threatening behaviors such as not recommending a female for command because she had a small child at home. The women were also concerned about additional family issues such as the possibility of not getting joint domicile with their military spouse and the difficulties of child care when they were not collocated with their spouse.

For these female officers, it seemed to be the cumulative weight of multiple factors or the addition of one more problem, that tipped the balance toward leaving (i.e., the proverbial straw that broke the camel's back). For example, most of the women indicated that they had been subjected to both subtle and not so subtle gender discrimination throughout their careers. However, with the barriers to promotions, the lack of assurance of retirement, and the uncertainty regarding the receipt of future challenging assignments, these discriminatory behaviors, which once seemed bearable, became less tolerable.

Findings from the LROC survey also point to a number of career issues for officers below the rank of major. In 1992, about half of all officers were satisfied with their career prospects. However, fewer expressed career satisfaction than expressed job satisfaction. And, there was a 10% drop in those reporting career satisfaction between 1988 and 1992. For overall career satisfaction, there were no gender differences (the level and decline were about the same for both females and males), however, when asked about their particular branch, the picture was not nearly as rosy. Although slightly more than half of both females and males reported good opportunities for advancement in their branch for someone with the assignments they had had; about 15% fewer women than men said that opportunities for command in their branch were good.

Different proportions of females and males also report that they were not in their desired branch (45% versus 38%, respectively). This finding is important because perceptions of branch desirability appear to have broader implications for career satisfaction. Officers who were not in their desired branch reported less career satisfaction, less confidence that they would get the assignments they needed to be competitive for promotion, and more limited command opportunities. Female officers who were not in their desired branch were even more negative than the males. As an example, when asked how good the opportunities for command in their branch were, only 37% of the female officers said they were very good to excellent; 52% of male officers said this. These data suggest that, from the perspective of junior officers, there may be branch specific limitations to their careers; and the branch effect may be exacerbated for female officers.

The Army's reward system places a high priority on the completion of successful command assignments, especially in combat arms branches. If command assignments are not available, this seriously influences officers' promotions and upward mobility. At levels above major, successful battalion and brigade command assignments are almost mandatory for promotion, irrespective of gender. The possibility that females may be less likely to have these opportunities available to them not only represents a barrier to upward mobility, but is possibly a major factor in influencing female officers to leave the Army prior to retirement to pursue careers with more possibilities for advancement.

As the document which evaluates officer performance, the officer evaluation report (OER) is the major tool used to select officers for assignments, promotions, and other career enhancing opportunities and it plays a critical role in the advancement of all Army officers. In our interviews with soldiers at all levels, both males and females have discussed their serious reservations that the OER actually measures and reflects performance. Perceptions that women and men are evaluated differently or that women possess fewer opportunities to compete for highly valued command assignments may contribute to female's perception that there is indeed a glass ceiling for female Army officers. We have no data on officers' perceptions of the equity with which evaluations are conducted and we are not aware of data that provides evidence that females and males are evaluated differently. However, there is, in fact, evidence that females are more skeptical about the efficacy of the OER than are males. Specifically, fewer company grade females than males in the LROC research believed the officer evaluation system was effective in promoting the best officers (22% versus 32%) or that the system rewarded officers for integrity and professionalism (20% versus 29%).

Mentoring

Effective mentoring facilitates the upward mobility of individuals at all levels of an organization. Mentors assist junior personnel by providing support and guidance, sharing substantive information and teaching, introducing subordinates to a professional network, and providing valuable personal contacts. A recent study explored possible gender differences in the mentoring experiences of Army officers (Steinberg & Foley, 1995). This research examined the hypothesis that differential mentoring, either in amount or type, was a contributor to the existence of a glass ceiling for females in the Army.

Survey responses indicated that, contrary to expectations, females were not at a disadvantage for being mentored. About 85% of female and male officers and senior NCOs indicated they were mentored in the past, and about 47% said they were currently being mentored. Respondents were also asked whether they had experienced various types of assistance from their mentor and how helpful each was. The types of assistance included personal development items (e.g., acts as a role model, demonstrates trust, instills Army values, provides moral/ethical guidance), sponsorship (e.g., provides sponsorship/contacts to advance your career, assists in obtaining future assignments, teaches/advises on organizational politics), and job coaching (e.g., provides feedback on your job, helps develop your skills/competencies for future assignments, assigns challenging tasks). Again, there were no gender differences either in the types of assistance provided or in the perceived helpfulness of the mentoring behaviors.

Commitment to the Army

Overall, both female and male soldiers express high levels of commitment to the Army and this commitment is demonstrated in a number of different ways. For example, in one survey, about 90% of all company grade officers reported they were proud to tell people that they were in the Army (Harris, 1994). Senior enlisted soldiers and senior officers also expressed a strong sense of belonging to the Army and said that service in the Army was more than just a job. Similar proportions of females and males said they would recommend that others pursue an active duty career in the Army and about 45% said they would recommend joining the Army rather than joining another military service or not joining the military at all (APSO, 1994a).

These expressions of commitment are especially remarkable during this period of significant downsizing which has resulted in shrinking resources, loss of job security, and shrinking benefits for all military personnel. Indeed, many Army leaders, irrespective of gender, indicated that the amount of change currently underway in the Army is too big (about 73%) and that the pace of change is too fast (about 69%).

Female and male leaders shared concerns about being able to remain in the Army, if they so desired. Over two-thirds of all soldiers said they are more concerned today than a year ago about their long-term opportunities in the Army, the kind of work they will go into when they leave the Army, whether they would be able to get a civilian job quickly if they had to, and the financial burden on them and on their families should they have to leave the Army unexpectedly. Most soldiers (82%) indicated that, as the Army became smaller, they would be allowed to stay beyond their current enlistment or obligation. However, fewer (about 69%) thought that they would be allowed to serve until eligible for regular retirement. And some soldiers thought that as the drawdown continued, they would be targeted to leave the Army involuntarily (APSO, 1994b).

Summary

The research presented in this section demonstrates that females and males share certain concerns. Females and males both:

- (a) are very concerned about whether they have a future in the Army and about their potential for civilian employment should they leave the Army,
- (b) consider career and family factors into their decision to remain in or leave the Army,
- (c) say that there are good opportunities for advancement in their branch for someone with comparable experience,
- (d) say they have been mentored in the past and are currently being mentored, and
- (e) are very committed to the Army and proud of their association with it.

Several of the differences between the perceptions of women and men seemed to reflect women's frustration with their perceptions of barriers which inhibit their upward mobility. Women, more than men:

- (a) perceive limited opportunities for command assignments and other career enhancing opportunities,
- (b) are not in their desired branch, and
- (c) express skepticism about the efficacy of the OER.

What has emerged is that women's experience with various forms gender discrimination may not only create a hostile environment for women, but has the potential to impose limitations on women's career potential. If these limitations negatively influence women's career decisions, they may leave, and the Army loses a valuable resource and a considerable investment.

Army Family Life

Service in the armed forces places extraordinary demands on members of the military and their families. The unique environment of the Army is characterized by frequent relocations, long and unpredictable work hours, separations from family which may last from several days to a year or more, and the soldier's exposure to life threatening circumstances. Although many civilians are employed in workplaces characterized by several of the above attributes, rarely are civilians exposed to all of these factors. These aspects of work in the Army impose significant demands on soldiers and their families. For

female soldiers, many of whom bear primary responsibility for managing their families and ensuring that family needs are met, these Army demands can be particularly stressful. Women in the Army must cope with the multitude of demands the Army places upon its members and cope with the demands made upon them by their family members.

In the 20 years since the inception of the All Volunteer Force, the representation of women in the Army has risen from 2% in 1972 to approximately 13% in 1995. This 20-year period of change for the Army has occurred during a major societal transformation characterized by women's entry into the labor force and the redefinition of the roles of American women, both in the home and workplace. Demographic and attitudinal data on female soldiers help us understand the extent to which female soldiers balance the multiple roles of soldier, wife, and mother.⁴

Marital Status

Although over half of all soldiers are married, female soldiers are significantly less likely than their male colleagues to be married. Furthermore, this difference applies to both officers and enlisted personnel. Among officers, 58% of females versus 80% of males were married. Similarly, among enlisted personnel, 51% of females versus 65% of males were married (APSO, 1995)⁵. And, although the percentage of male soldiers who are married steadily increases with rank, the percentages of married females at the senior enlisted and senior officer ranks either levels off or declines (Schumm, Bell, & Tran, 1993). For example, according to 1991 DEERS data, 87% of male sergeants first class were married, compared with only 51% of females at this rank.⁶ Similarly, 91% of male lieutenant colonels were married although only 49% of their female peers were. Army data also suggest that females have smaller families; 25% of female soldiers compared to 41% of male soldiers reported having two or more dependent children in the home (APSO, 1994b).

Marital status has important implications for Army retention and for soldier well-being. Previous research shows that although marriage has the effect of increasing

⁴ In 1989, the Army Family Research Program (AFRP) collected data on over 10,000 soldiers and their spouses. Much of the research cited in this section is based on this data (see Bell, Scarville, & Quigley, 1991 for an overview of the AFRP and its products).

⁵ On the SSMP, the Army Personnel Survey Office defines married soldiers as those who are married, remarried, or separated, since the Army considers soldiers married until a divorce is final.

⁶ The Defense Eligibility Enrollment System, most commonly known as DEERS, contains information on the families of service personnel who have had some interface with the family support system (e.g., obtaining family member ID cards).

males' retention, it is associated with a decline in females' retention (Segal & Harris, 1993). There is evidence that one of the family factors soldiers consider when making their retention decision is the extent to which their spouse can obtain appropriate employment. Females in one small Army study considered their husband's career opportunities when making their career decision. In other research, female officers were more likely than their male peers (29% versus 12%, respectively) to indicate that they would leave the Army if their spouse could not find the type of employment he/she wanted (Harris, et al., 1993). But this issue is not only a consideration of married female soldiers. Married male soldiers will increasingly face this issue as more civilian wives expect to progress in their jobs or express the desire for careers.

Although female soldiers are less likely than males to be married, they are more likely than their male peers to be divorced. Twelve percent of female officers were divorced; only 4% of the males were. Among enlisted personnel, 15% of the females were divorced; only 5% of the males were (APSO, 1994b). In addition to the lower rates of marriage among senior Army females, these data on divorce also suggests that marriage poses unique stresses for Army women.

Dual Military Families

A consequence of rising female representation in the Army has been an increasing proportion of dual military couples. By the early 1990's, about 10% of both officers and enlisted personnel indicated that their spouse was also a member of the military. Among soldiers in dual military relationships, most reported that their spouse was in the Army and only about 6% reported that their spouse was in another branch of the armed services (Schumm, Bell, & Tran, 1993). Female soldiers were much more likely than males to report that they were married to another member of the military. For example, among the officer corps, 54% of females versus 7% of males had a military spouse. Among enlisted personnel 63% of females versus 10% of males were in dual military marriages (APSO, 1995).

Most married soldiers consider both job/career and family factors when making the decision to remain in or leave the Army. However, soldiers in dual military relationships have a special set of concerns. Given the unique stressors associated with juggling two military careers, it is not surprising that research shows that dual military families are characterized by fewer children than those in which one spouse is a civilian (Brinkley, Gabel, & Tastet, 1991 as cited by Schumm, Bell, & Tran, 1993). Among the family factors affecting the career decisions of women in dual military families are concerns about pregnancy (Teplitzky, 1988), and role overload stemming from combining motherhood and the demands of an Army career (Harris, Steinberg, & Scarville, 1994).⁷ Institutional factors such as the respondent's perception of the extent to which the Army accommodates dual career couples and the likelihood of joint domicile in their assignments also influence the commitment and retention of females in dual military relationships (Harris, Steinberg,

⁷ Interestingly, Teplitzky (1988) found that concerns about pregnancy were influential in the career decisions of both males and females in dual military marriages.

& Scarville, 1994; Teplitzky, 1988). In the small study of recently promoted female officers who were leaving the Army, Harris et al. (1994) found that the competing roles of Army officer, wife, and mother seemed worth it to the women, as long as they perceived opportunities for upward mobility and the receipt of challenging assignments. Without these opportunities, the demands could not be justified.

Single Parenthood

Single parenthood is an issue of great importance for the armed services as it has enormous consequences for readiness and deployability. An examination of the numbers of single parents in the Army shows that there are far more male single parents than female. However, this is an artifact of the fact that the Army, like its sister services, is mostly male. A closer examination reveals that females are much more likely to be single parents than males. Approximately 16% of all Army females are single parents compared to 4% of all Army males (Schumm, Bell, & Tran, 1993). Research conducted by the Army further suggests that single parenthood is oftentimes not permanent and that the number of soldiers who will actually experience single parenthood at some time during their Army career is greater than the number of soldiers who are currently single parents (Segal and Harris, 1993).

In one Army study, researchers found that single-mother and single-father households differed on the age of the oldest child and the levels of adaptation to Army family life (Bowen, Orthner, & Zimmerman, 1993). Families headed by single mothers were more likely than families headed by single fathers to have an infant in the household. In 18% of single-mother households and 6% of single-father households the oldest child was less than one year of age. Only 10% of the single mothers reported that their oldest child was 10 or older; 33% of the single fathers had an oldest child over 10. However, despite this difference in family composition, Bowen and colleagues (1993) found that both single mothers and single fathers reported that their families had adjusted to Army demands. In fact, families headed by single mothers reported a somewhat higher level of adjustment to the Army than families headed by single fathers. Single mothers also reported more work predictability, family strength, and social support than single fathers.

Work-Family Conflict

The data on marital status, single parenthood, and dual military marriages suggest that women in the Army face unique stressors as a consequence of their multiple roles. Indeed, female company grade officers in LROC were more likely than their male peers to agree that the demands of an Army career make it difficult to have the kind of family life they would like (54% versus 40%, respectively). And, these company grade females were also more likely than comparable males to foresee a lot of conflict between their work and their family life if they made a career of the Army (51% versus 41%). Yet, work-family conflict is not solely a problem for women. About 30% of both female and male company grade officers agreed that their personal or family plans were frequently or almost always disrupted by the demands of their jobs. And, few of these officers, irrespective of gender, believed that a rewarding career could compensate for limited personal and family time.

The amount of work-family conflict experienced by all soldiers (and especially female soldiers) and the efficacy of soldiers' coping mechanisms, have enormous consequences for the Army. In recognition of the importance of family life on soldier well-being and of the critical influence of soldier well-being on retention and readiness, the Army maintains an array of social support programs available to both soldiers and family members. However, the evidence suggests that more needs to be done to ensure that females can progress in their Army career and maintain satisfying marital and parental relationships. If the representation of married women at the higher enlisted and officer ranks increases, perhaps more Army women will perceive that the difficulties associated with integrating a successful Army career with a satisfying family life can be overcome.

Summary

One major shared experience was that both females and males experience family disruption because of their job demands. However, we have noted many more dissimilarities between Army men and women, including that:

- (a) females are more likely than their male peers to be unmarried,
- (b) if married, females are more likely than males to have a spouse who is also a member of the military,
- (c) females have smaller families and younger children than males,
- (d) females are more likely to be a single parent, and
- (e) females company grade officers are more likely than their male peers to think that they will experience more work-family conflict as they progress in their careers.

Conclusions

One of the themes that clearly emerges in each of the areas discussed -- Army jobs, Army careers, and Army family life -- is that many stressors impact on both female and male soldiers. Soldiers in this downsized Army, irrespective of gender, are under significant stress resulting from long hours, unpredictability at work, and shrinking resources. Despite these conditions, females and males alike express tremendous commitment to the Army. And, although satisfaction with career prospects has declined for some in recent years, many soldiers report that they are satisfied with their jobs.

Although female and male soldiers share many of the same concerns, females also have some issues that appear to be unique to them. Relative to men, more women express concerns about career opportunities that are not open to them, gender discrimination, joint domicile, and child care.

From a research perspective, theories often help us understand the differences in male and female behaviors and provide insight into why this is so (Eagly, 1995). At least two theoretical perspectives, social status theories and social role theory suggest possible reasons for the data we have discussed in this chapter. Social status theories posit that those in higher status positions are assumed to be superior to those who are not in that status. Thus, in the Army, if males are considered to be of a higher status than females, then the valued characteristics and traits of the military such as, competence, leadership, physical prowess, and assertiveness, are attributed to Army males. These attributions can, in turn, influence soldiers' perceptions and behaviors such that males' reactions to and opinions of females may be driven by the fact that females are not male, and therefore cannot possess these valued characteristics. Social role theory, focuses instead on the set of expectations associated with the social roles held by members of the society. Although changing, society continues to expect women to perform the traditional female roles of mother, nurturer, caretaker, and peacemaker. Thus, this approach would appear to explain male resistance to women performing non-traditional tasks such as engaging in combat or commanding a battalion.

In keeping with this, many Army males focus on the family factors to explain why women leave the organization or do not progress as rapidly (e.g., women leave to have children or care for their families). And, while it is certainly the case that women are more likely to leave the Army sooner than their male peers, and that a primary contributor to this exit from active duty Army life is women's concern about their families, this explanation is overly simplistic. We see evidence that women are as proud of their association with the Army and are as committed to it as men.

Several critical phenomena influence the lives of female Army personnel and help us explain such differences. Women, more than men, must cope with the role conflict and role overload that stems from maintaining demanding professional and personal lives, because it is women who, in many circumstances, bear primary responsibility for maintaining family life. Oftentimes it is they who must find creative ways to juggle career and family. As we suggested, some females may resolve this conflict by choosing not to marry or choosing to have fewer children or by finding other ways to cope with the stress of competing role demands. Women also perceive that certain aspects of the institution constrain their Army career success and create a stressful environment in which to work. For females, career factors, limited upward mobility, and the constancy of gender discrimination are equally as important as family factors in their career decisions; and, to some females, they may be even more important. It is clear that a confluence of factors seem to influence all soldiers' decisions to remain in or leave the Army.

Despite the significant changes in the Army over the last 20 years, many male/female issues have yet to be resolved in ways that will satisfy both groups. As evidence that they are not totally accepted, female soldiers point to persistent individual behaviors on the part of some male soldiers which indicate that they do not believe women belong in the Army. They also point to Army policies that continue to limit women's advancement and to foster the attribution that they are not as valued or as capable as men. It has become apparent to us over the last 5 years of our research that most female soldiers want to be treated as soldiers first; not as women first. They want to fit in, to be accepted,

and to be allowed to excel in this male-dominated organization. Women see themselves as just as motivated and just as competent as their male counterparts. In many ways the Army is underutilizing an important resource. The women in green who have been the focus of this chapter want to be recognized and valued for all they can be.

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**Cultural Stressors During Deployment:
Implications for Women's Health and Performance**

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Introduction

The United States military is stationed all over the world. Long time presence in Germany, Korea, Okinawa, Panama, Vietnam and recent deployments in Saudi Arabia, Somalia, Rwanda, Haiti, and Bosnia have brought military personnel into contact with a sizable variety of the earth's cultures in the course of carrying out their ever diversifying missions. There is very little systematic data on the nature of their transcultural experiences or on whether cross-cultural misunderstandings and stresses have seriously impeded performance. As women have become more closely integrated into the U.S. armed forces and multinational forces have become the norm, the effect of disparate gender roles should have gained in importance. This paper examines some of these issues by laying out a logic of analysis.

War has probably always been a primary means of exposing human beings to unfamiliar ways of life. Conquered or immigrant peoples who have lost their language and most of their original culture within one or two generations serve to remind us that culture is learned. It is often defined simply as the learned patterns of behavior and thought shared by a group of people – a society. This learning is never perfect replication, change from within and without is constant, and what is learned varies among differentiated parts of the society: by gender, ethnic group, class, or other significant division. Some aspects of culture may be deeply embedded in people, providing the glasses through which they view the world, resistant to formulation in conscious thought, while others are ephemeral, hardly remembered in twenty years. At any one point in time, it is hard to tell the difference.

Culture shock

According to anthropologist Cora Dubois (1951), the term culture shock, which she first heard from anthropologist Ruth Benedict, was used informally among social scientists from the early thirties to describe "the peculiar emotional state we anthropologists developed when we were working in the field (1951, 22 quoted in Golde, 1970, 10)." This state resulted from anxiety caused by the loss of the familiar which caused frustration, aggression against the cause of the discomfort (either repressed or acted out), a longing for the familiar and comfortable, and tremendous anger at trivial interferences (Golde, 1970, 11).

The concept was elaborated by Kalervo Oberg in 1954 in the context of a joint Brazil-U.S. Cooperative Health Program (Oberg 1954). Although the individual phenomena Oberg subsumed under the concept are well known to anyone who has lived in another culture, his conceptualization of culture shock as a process that takes place along a timeline was seized upon by the development community, the Peace Corps, the State Department, and others with a vested interest in helping Americans deal with the stresses of foreign assignments. Since the folk use and medical model of culture shock singles out the depressed, anxious, angry bewilderment state a person living abroad may experience when many of his accustomed cues to everyday behavior disappear and are replaced by unfamiliar ones, it is worth recalling Oberg's original description of the stages of culture shock.

His phases define a process of adaptation to an unfamiliar culture that has a course, one which, while often very painful, can be eased and transcended by an understanding of what is happening. When the stress literature expanded in the 1970s, culture shock was absorbed into it as a specific form of stress against which there were some effective counter measures (Brink and Saunders, 1976).

Oberg called his Phase One the honeymoon phase, a phrase still in use (Pederson, 1995). This initial phase is characterized by excitement, a strong desire to learn about the people and their customs, and a plunge into whatever work brought the person where he is. People, such as tourists or military on R & R, who are only staying a short time in a strange place do not have to leave this phase. Because troops do not ask to go to the countries where they are assigned, the honeymoon phase may have to be reexamined for deployments to see the circumstances under which it can exist, and how long it lasts.

While Oberg did not name the rest of his phases, others have provided an assortment of labels. Phase 2 has been called the disenchantment stage (Brink and Saunders, 1976), the disintegration stage (Adler, 1975), and the crisis of engagement (English and Coleman, 1966) since you cannot experience culture shock unless you are interacting with members of the host culture. This stage is the one usually described, when a person realizes she will be where she is for a long period. Things that originally were interesting may become sources of annoyance; tasks of daily living are frequently very time consuming because they must be done in unfamiliar ways; there is a dawning realization of the depths of one's ignorance and sometimes the guilty admission that you simply do not like these people. Continual feelings of social ineptness often trigger depression.

People who have had prior experience in changing life ways, who understand what culture is and have a firm knowledge of their own, will have developed an array of coping skills and may skip Phase Two and move directly into the next one. Others may give up and go home, or be able to move into resolution only with help.

Phase Three, Brink and Saunders' beginning resolution phase, or Adler's reintegration phase, in Oberg's conceptualization involves gaining an adequate handle on the language and appropriate behavior patterns, attempting to make friends, and participating in festivals, ceremonies and other aspects of daily living. Adler (who uses one more stage than Oberg) emphasizes the outer-directed anger and resentment toward the new culture that is characteristic of growing competence – getting to know a new culture is very hard work and you find out things about yourself you may not like.

Adler calls the next stage autonomy, and it fits with Oberg's Fourth Phase. It is the effective function stage in which both one's own culture and the other can be kept in perspective, differences are viewed with humor. While getting along about as comfortably in either culture is part of Oberg's fourth stage, Adler allocates this to a fifth stage, which he calls interdependence. Few people, unless they are deliberately exchanging one culture for another, as permanent immigrants into a new situation manage or need to manage to become more than basically culturally competent. Acting with an "accent" caused by an underlay of your own culture is usually as acceptable as speaking a new language fluently with an accent shaped by the sound system of your native tongue. Just as there are many

areas of your own culture you know nothing of, such as how to design an atomic submarine, there will be many aspects of the new culture that you have no need to master. The school of anthropological theory that conceptualizes culture as a set of rules for behavior posits that a person whose behavior is appropriate in daily situations may be said to "know" that culture.

Several writers (e.g., Gullahorn and Gullahorn, 1963) have extended the culture shock sequence, equating the stresses of going home or reentry into one's own culture to reverse culture shock requiring considerable cognitive and emotional adaptation. Coming from a poverty stricken country back into affluence long forgotten is a common stressor. Others are adjustment to different types of time demands, or traffic and noise (Australian Army, 1995). A British anthropologist has endeared himself to generations of students with his description of how difficult it was for him in London, upon his return from two years in Africa, to refrain from patting the stomach of every pregnant woman he met on the street – a gesture of good luck that had become automatic (Middleton, 1988). Women returning from areas where they have veiled their face and never made eye contact with a man, can feel violated by a casual touch. It can take a surprising length of time to readjust. If a soldier's own culture has undergone a significant change while he or she has been away, as was unusually true for Vietnam veterans returning to the U. S. after the rise of the anti-war movement, the resulting stress can easily exceed any culture shock met with overseas.

The Medical vs. Educational Model of Culture Shock

The medical model of culture shock sees it as a pathological reaction to a particular form of stress. This view is succinctly put in an Australian Army deployment guide, "... culture shock serves no productive purpose. So try to prevent it (1995, 36)." The behavior associated with phases two and three of severe culture shock can, of course, be very disruptive and potentially hazardous to the individual and intercultural relationships. An alternate view sees culture shock as an educational process that, if understood, provides a means of controlling disruptive behavior and moves the adaptation process along a learning curve that leads to enrichment, to the development of a multicultural persona (Adler, 1975). The stages of culture shock, however conceptualized, and there are several other sequences in the literature, provide such a model.

Among those who think that experiencing some degree of culture shock is essential for world citizens are anthropologists (see also Pederson, 1995). First of all, becoming involved with another culture teaches you what of your own behavior is culturally shaped, useful knowledge for adaptation. Despite training, the tendency is to assume beliefs and behavior are common to humanity. Since much of culture is not kept in the conscious mind, only by having contrasting experiences can it be examined. Many an American woman who has eagerly tried on that ultimately graceful dress, an Indian sari, has discovered to her complete surprise that her mode of moving her body makes her look ridiculous in it. Despite reading, TV, and all the other sources of knowledge available about others today, interacting with people is still the best teacher.

The traditional professional rite of passage for anthropologists is fieldwork, immersion in another culture for the purpose of describing it. As noted above, culture shock had been known and discussed privately among professionals since the early thirties, but probably because it did not seem scientific to discuss the researcher's emotional state, nothing was written about it until the fifties, after World War II. In 1954, the same year Oberg's book was published, Laura Bohannan's fictionalized account of the emotional aspects of her fieldwork among the Tiv appeared. She felt it necessary to use a pseudonym to describe the stresses of culture shock she went through. The title she chose, Return to Laughter, echoes Oberg's resolution phase (Bowen, 1954).

Interestingly, as more such autobiographical accounts were written, most were by women (Golde, 1970; Arana, 1989). There have been several explanations put forth for that striking phenomenon, but no agreement on why women thought "journeys of the self" material was more important, or perhaps less professionally dangerous, than men did. These autobiographies are valuable training guides to the nature of culture shock and the processes of working through it. The model they present is educational, not medical. One of the major stressors reported by some of these authors is their reaction to the difficult position of women in the societies they were studying, even though they themselves, as strangers, were exempt from the pressures (Golde, 1970). Perhaps it will be women military personnel who will chronicle transcultural deployment experiences.

Deployments and the Degree of Engagement With Other Cultures

Not all military activities bring personnel into the same kind and intensity of contact with members of another culture. Contextual factors such as the nature of the mission, the length of deployment, the isolation of troops, and leisure time in safe areas are of paramount importance. Active war is not the kind of relationship that fosters cultural knowledge while the fighting in progress, as important as this knowledge might be to bring success. Everyone is too busy trying to survive.

It is no exaggeration to point out that the United States was totally unprepared to fight the Japanese in World War II, and had little organized knowledge of the areas in Asia and the Pacific where the fighting took place. For those accustomed to today's humanly and technologically sophisticated intelligence methods, it seems inconceivable that our government pled with people who had travelled in those areas to send in their photographs, but such was the case.

The Japanese were an enemy perceived to be at a great cultural distance from us, considered "alien," who did not follow European rules of war. Much about their behavior was bewildering, perhaps nothing more so than their policy of "no surrender." During the war, the anthropologist Ruth Benedict was assigned the task of making sense out of this and other cultural "oddities."

American commanders fought as long as they could be effective, but then surrendered to preserve the lives of their men. In contrast, the Japanese in the North Burma campaign had 17,166 dead to 142 captured, an extraordinary ratio (Benedict, 1946). Not

only did they routinely fight to the last man, leaving only the wounded to be captured, but these wounded tried to take out further enemy troops. The fear of booby trapped wounded caused Americans to kill Japanese who did surrender. The warrior ethic, often summarized under the term the Cult of Bushido, dictated that a soldier going to war could not return unless victorious. If he surrendered, he was dead to his culture. This led to behavior on the part of some prisoners that astonished and confused Allied commanders. As Benedict describes it:

Some men asked to be killed, 'but if your customs do not permit this, I will be a model prisoner.' They were better than model prisoners. Old Army hands and long-time extreme nationalists located ammunition dumps, carefully explained the disposition of Army forces, wrote our propaganda and flew with our bombing pilots to guide them to military targets (1946, 41).

When they realized they could trust this information, the Americans did everything they could to capture prisoners alive.

Following the war, the occupation of Japan provided a very different, long-term exposure to Japanese culture for U.S. servicemen. A significant number became enamored of the culture, learned something of the language, and married Japanese wives. Of recent U.S. deployments, Vietnam, Panama, and Operation Desert Shield/Desert Storm (ODS) were war situations. The Vietnam engagement lasted many years and some military personnel served several tours of duty. A proportion became deeply engaged with the culture, set up families, and enjoyed the life of the cities which were usually free of war. The number of men who have returned since to visit or even live there, even though the enemy triumphed, argues for a special attraction. Panama was too short an engagement to provide the incoming troops much opportunity to get to know the country.

In ODS, the half million troops were preparing for war that they thought might include biological and chemical weapons. The combat troops lived isolated in the desert or on ships at sea for less than a year under very harsh conditions, were swiftly, almost mysteriously, victorious, did not occupy Iraq, but came home. Support units which included women, were concentrated in cities, but they also were busy preparing for war with an enemy that was "alien," perceived, as were their principal allies, to be at a great cultural distance. It is often noted that no one has ever heard anyone say they would like to go back to Saudi Arabia or Kuwait. Cultural exchange was minimal.

Defense forces, such as those in Germany, Korea, Panama, and Okinawa, have a long time institutional presence, even though accompanied or unaccompanied tours of duty are for only two years. Unless the relationship has soured completely, as it appears to have in Okinawa, these situations provide maximum opportunity for cultural learning.

The recent humanitarian and/or peacekeeping missions of the U.S., represented by Somalia, Haiti, and Bosnia are yet again another type of deployment. Several problems may conspire to separate military personnel from the civilian culture bearers. Recent or ongoing fighting, with violence often directed at the troops may make freedom of

movement or interaction problematic. For the U.S., it is politically necessary that these missions be time bound, with a year the preferred maximum. In other words, as conditions normalize, the troops pull out.

Most of today's deployments are manned by multinational forces, requiring close cooperation between troops of different cultures, cooperation that can become stressful and overshadow relations with the host government (if there is one). These sensitive problems are not openly discussed, but are glancingly referred to in the media. Of all the deploying nations, the U.S. has by far the largest proportion of women in their armed forces, the most closely integrated throughout all but combat units, and, by this token, the largest number of officers. This is particularly true of the Army and the Air Force.

Canada, Australia, New Zealand, the Scandinavian countries, Pakistan, Algeria, Bangladesh, Tunisia, and Morocco frequently provide units for U.N. deployments (many of which the U. S. is not involved in). These cultures are of varying distances from the U.S. way of life and their military cultures include women to different degrees. The Anglophone countries, in support units, approach the U.S., but combat units, and the forces of other countries are all male. This can be a factor in cross-cultural relationships.

Transcultural Stressors

Assuming deployment brings meaningful engagement with an unfamiliar culture, it is useful next to categorize the major sources of stress that will exist. Brink and Saunders' simple, five category scheme: communication, mechanical differences, isolation, customs, and attitudes and beliefs (1976, 128-29) is a useful springboard for discussing applications to the military.

In a transcultural situation, the overarching stressor is inability to communicate, both verbally and non-verbally. People from the United States are fortunate for two reasons. English is a world language spoken by many peoples, and our multicultural society can provide native speakers as interpreters, such as those used in Haiti and Somalia, for a wide range of languages. Nevertheless, there are many situations where the inability to talk with or understand people speaking in their own language is frustrating and leads to all kinds of erroneous, frequently paranoid, assumptions. The more threatening the overall situation, the more threatening the inability to understand. Even the simplest effort to speak the language, mastering the greeting patterns, will usually elicit a disproportionately positive effect. Next in importance would be mastering the words and phrases needed in the course of executing the mission.

Non-verbal communication is equally important. It is this area that produces most of the lists of "dos and don'ts." Never touch food or a person with your left hand, don't make eye contact, don't shake hands, don't have your head higher than a superior's, etc. down an endless list from various parts of the world. Proper non-verbal behavior is frequently quite different for men and women. An example of how important it can be to master the essentials of non-verbal behavior quickly is provided by the recently arrived, unacculturated Korean shopkeeper in an African American neighborhood. Smiling, which

we consider an essential accompaniment to friendly human interaction, is a private act in Korean culture reserved for intimates. When an unsmiling shopkeeper puts a customer's change on the counter instead of handing it directly to him, an African American often becomes enraged because he puts those acts into an entirely different, emotionally laden meaning system.

In order to help people over their initial fear of making some terrible mistake in another culture, a wise anthropologist used to teach, "A boor is a boor in any culture." That is, a person without antenna to pick up others' reactions, who continually reads his own ideas into their behavior, is never going to learn how to behave in his own or any other culture.

The second category of cultural stressors, mechanical differences, or housekeeping details, that differ between cultures can take a lot of getting used to. Bargaining for a purchase in the market every once in a while is one thing, bargaining daily for food because there is no refrigeration is another. The deployed military are partially protected from these cultural frustrations, because they make every attempt to carry their own material culture with them. Conditions may not be "normal," particularly at the beginning of a deployment: food may be MREs, housing in tents or barracks so crowded the beds are touching, but sooner or later there are showers, turkeys for Thanksgiving, television, and hopefully smooth access to family at home through telephone, mail, or Email. Frustrations are attributed to weather, flies, sand in the tanks, inefficiency of the command, etc., not the culture surrounding them.

On the other hand, housekeeping culture can become very important to families stationed overseas who live off military bases. Conditions like the inadequacy of housing in Europe and the necessity of doing everyday things in unfamiliar ways usually impact most heavily on wives.¹

A recent review of 188 research reports on military families cites a family's need to adapt to five main stressors: "(1) relocation (moving a household), (2) living in a foreign culture, (3) prolonged family separation, (4) physical danger, and (5) the institution of the Army itself" (Schumm, Bell, & Tran, 1994). Rather than specifying material about adapting to a foreign culture, the authors combine material on (1) and (2), by contrasting the difference in perceived stress between relocating within the continental United States (CONUS) and outside CONUS (OCONUS). In 1992, more than 40% of active duty soldiers were stationed OCONUS, and a study done the same year found that levels of marital satisfaction and emotional well-being among soldiers living OCONUS was lower than those who relocated within the country (Burnam, et al, cited in Schumm, Bell, and Tran, 1994, 5). Families with children, particularly adolescent children, had special problems. Although the review authors mention in one or two places perceptions that living in a foreign country is considered a good opportunity, they relegate to a footnote reference

¹Unfortunately B. Marriott's 1982 paper, A study of culture shock and cultural stress as determined by levels of satisfaction and perceived coping skills of three American wives groups living in England, Europe: HUMANRESMANSYS could not be located.

eight studies that "indicate positive aspects of relocation, such as learning a new language, meeting new people, or learning about a new culture . . . (5)."

The third category of cultural stress is isolation, the sense of being surrounded by the strange. Few military personnel will suffer the isolation felt by a lone Peace corps volunteer working by herself in a Zambian village, although members of Special Forces and small units in Haitian villages might dispute that. Because of its heavily psychological orientation, most of the culture shock literature focuses on the individual as the unit of adaptation. There is even an argument about whether the culture shock phenomenon is intrapsychic (wholly psychological) or interpersonal (socio-cultural). As Wright describes in her commentary on this overview, the primary unit of adaptation, in the U.S. Army at least, is not the individual but the small, tightly bonded work group, a soldier's 'family.' High cohesion within this group provides its members with a strong support system helping buffer them against any stressors they face up to and including combat (Wright, 1966). Should cultural stress become an issue, this unit would seem the natural context to address it in. Isolation would then not be a stressor.

The readily visible behaviors often called customs are a fourth source of cultural stress. A good illustration would be the area of role relationships between men and women. The division of labor, marks of deference, clothing requirements, sexual cues, participation in public and private life—the list is very long and shows what a complex job it is to describe, for any society, the position of women or men. That a woman appearing in public in Saudi Arabia must wear the full head and body cover of the black *abbayah* is easy to observe. Some American women could not stand this, but others complied without stress if they wanted to move around in Riyadh when off duty. During the ODS deployment, newspapers were full of the "crisis" of American women driving when Saudi women were forbidden to. While many troops deployed to ODS could describe these customs, it is doubtful if they could accurately assess the complexities of the "status" of Saudi women, particularly including the periodic European incarnations of upper class women during which they abide by other customs.

Lauriston Sharp has pointed out that "the cookie cutter concept of culture," which implies neat boundaries around distinct ways of behaving, is a seriously inadequate way of conceptualizing the flow of the world's ideas and behavior (Sharp, 1969) The above example illustrates this, and underlines the dangers of using customs or culture to construct and act upon a stereotype.

The fifth area of potential cultural stress involves attitudes and beliefs, unobservable organizations of the cognitive and emotional world that produce behavior that cannot be immediately understood or interpreted until it is fitted into a frame of meaning. An example from Somalia will illustrate. Somalis are very proud of their physical appearance: aquiline nose, thin lips, and hair that is gently curled. As they categorize peoples, anyone of the Bantu type with dark skin, flat nose and thick lips is a lesser type of human, worthy of being referred to only by the term for slave. African American troops of this physical type, if they were not forewarned, were considerably startled and upset when little boys followed them with two fingers up their nostrils to spread their nose, lips everted, and winding their hair into tight curls. This had nothing to do with the troops being troops or Americans, the

children would have behaved the same way toward anyone who looked like that (personal communication, D. Marlowe). Considerable explanation of Somali history, ethnic ranking, and other deeply embedded beliefs is necessary to convince someone this behavior was not meant personally.

Ranking Trancultural Stressors

There have been attempts to quantify cultural stressors and explore the issues of the difference between different societies' perceptions of what is stressful. Spradley and Phillips (1972) chose three groups: returned Peace Corps volunteers (who had served in over twenty different countries); Chinese students in the U.S.; and American students who had never had crosscultural experience. They define a stressor as "any condition which an individual judged as requiring some accommodation or readjustment in ongoing life style or behavior." Stressors were viewed as varying in intensity and length of time. A list of 33 stressors were empirically derived from the literature about Americans abroad. The respondents were told they were to live in the culture one year and that the cultural differences were large. The type of food eaten was arbitrarily rated as 500 and the respondents were asked to rate the other stressors using that as a standard. All three groups rated learning the language as requiring the most adaptation. As an example of differences, Peace Corps returnees rated learning new (more relaxed) attitudes toward time as next most difficult, a subject that didn't bother the Chinese who rated changes in family relationships and the content of relationships between unmarried men and women as most stressful.

The effect of the adaptor's culture on adaptation to **specific** other societies has not been studied in any systematic way even for American (generic) culture, let alone our array of sub-cultures. It has proven difficult to identify for sure personality traits or individual experience that would predict an ability to deal with cultural stress effectively. Situations are complex and differ too markedly for generalization. A Cambodian refugee from the killing fields trying to adapt to life in Los Angeles carries a lot of non-cultural baggage.

Golde (1970) is the only source found that discusses gender based reaction to cultural stressors and that is in the context of women anthropologists. Someone who adapts easily to one culture may not be able to deal with another. State Department and UN application blanks always ask, "What countries do you not want to go to?" Attempts to predict performance have given way to providing an external environment of training, social support, and counselling, if necessary, for people working overseas.

Deployment Stressors

The deployment stress literature, like the army family literature, is based mainly on closed questions of two kinds. In one, the reported overall level of stress, with sources unspecified, is measured by instruments recording psychological and physical symptoms which are then plotted against demographic variables or organizational characteristics such as perceived unit cohesion (Wright, 1966), or the researchers choose known stressors such as issues of family separation and measure them against demographics, perceived danger of

assignment, and the like (Hammelman, 1995). Those studies that utilize interviews, focus groups, and other such means of eliciting information tend to deal with organizational issues that can be manipulated and ameliorated. The outside cultural context has a shadowy existence.

One of the few sources found that addresses deployment stressors directly and specifically is the Soldiers' Handbook prepared for members of the Australian Army deployed to Rwanda (Australian Army, 1994). A sturdy seventy-four page booklet designed to fit into a soldier's shirt pocket, it is packed with information ranging through history, religion, rituals, useful phrases in Kinyarwanda and French, health hazards including pictures of poisonous snakes, street maps of the cities, all ground weapons in service, various first aid procedures, and an important section on deployment stress:

Combat Stress

Historically, combat stress reactions occur at a rate of about one for every three or four wounded. In a tense situation, where opposing forces are anticipating but not engaging in action and where environmental stresses are high, the number of stress reactions and stress-related incidents increases and non battle injuries can increase dramatically. In the present scenario, this may be further complicated by the sight of suffering people.

Likely Sources of Operational Stress

- Suddenness of deployment
- Danger/Risk of accidents
- Bureaucracy
- Separation from family/friends
- Death or injury
- Catastrophe or traumatic incident
- Lack of freedom of movement
- Frustration over rules of engagement
- Level of political/media interest
- Isolation
- Cultural and language differences
- Over time losing touch with mission goals
- Friction between members of the multinational force (23)

There follows a description of the physical, mental and emotional, and behavioral signs of stress. The control measures recommended include keeping in good physical shape, allowing adjustment time, accepting reality, using relaxation techniques, talking out problems in a group, and writing letters and diaries. In addition, while it is not specifically mentioned, the fact that the booklet contains fifteen pages on the history, geography, culture, and language of Rwanda, plus maps, suggests that another effective means to overcome some of the stress of being surrounded by a foreign language and culture is to learn about them and participate in public events, time honored methods for dealing with culture shock.

The Australian Army Deployment Guide (1995) has a section on culture shock (35-36). After noting that initial reactions to the new culture are often positive, it continues:

However, at some stage you may find you start to become very negative—even hostile— and begin to reject everything about the local culture. Common statements are: 'Can't people do anything right?' 'The government here is incompetent.' 'It stinks, the food is crap, the people are filthy and it is so disorganized.' 'Who would want to live here?' 'There is nothing to see or do here.' Other characteristics of culture shock include a longing to return to Australia, avoidance of the local people, laziness with language barriers, and blaming the locals for all your problems and difficulties (35)

They recommend avoiding sitting around drinking beer with your mates, but urge going out to talk with the locals, becoming involved in the local community if at all possible, working on the language and history, trying to imagine what you would have been like if you had been born there, retaining a sense of humor, and appreciating cultural differences. The Australians are nothing if not optimistic!

The expectation of transcultural stress, particularly about and for women, determined some of the military policy in the Gulf. Prior to the deployment to Saudi Arabia, the U.S. Central Command published a small document about generic Arab "dos and don'ts." The emphasis in this was on preventing people from offending the host government/culture. It was followed with policy letters on alcohol, dress code, religious services, etc. This emphasis appears to be the thrust of our multi-cultural education today. While knowing about specific behaviors that may cause trouble is an important aspect of transcultural knowledge, it trivializes whole ways of life and negates the host's knowledge that cultures differ and "mistakes" can be negotiated.

Knowing that it is very disrespectful to cross your legs while talking to an Arab is useful, but as a negotiator, describing a session with Saddam Hussein, said in a TV interview, "I forgot and crossed my legs, he threw me out and I thought it was all over, but he called me back and we started again." In any case, the policy details had a backlash effect on U.S. troops who resented all these instructions when they saw themselves as risking their lives for these folk (personal communication, Kevin Wright, LTC U.S.A.).

The policies were most carefully enforced in the capital and more relaxed the further out toward the front/north you got. An area of great concern was how to provide rest and recreation which was severely restricted to avoid "beach dress and behavior." In the end naval vessels offshore were designated recreation sites. In the case of ODS, the effort to prevent transcultural stress led to separation as the major mechanism.

Conclusions

Culture shock is best viewed as an educational process that has several stages, rather than a pathological condition. Cultural stressors, like other stressors, affect people differently under different circumstances. The transcultural aspects of deployments are

determined by the type of unit, the mission, the length of time in the area, and the attitude of the host culture. The more separation there is between troops and the local people, the less likely the crisis of engagement will occur, the less of a problem cultural stressors will be, and the less troops will learn. Probably the maximum cultural learning for military personnel takes place in situations like Germany, Panama, Korea, and Japan where there is a stable society. However, knowledge of the nature of culture, the stages of culture shock, the variety of cultural stressors, and ways to help people adapt would be useful anywhere. Even elementary knowledge of language, history, and culture can be very reassuring. I was impressed with an Army nurse being interviewed on TV who said she had been in three wars, and no one had ever told her anything about the country where she was or the mission she was part of. In the Somalia, Haiti, and Bosnia deployments, centrally produced culture/area familiarization guides were distributed.²

There is little information on the transcultural experiences of the military, as opposed to the Peace Corps, development community, diplomatic corps, and businessmen, with the exception of the Army literature on families which is not as specific as one would like. There is sparse material on women's (as opposed to men's) reaction to cross-cultural stress in any group, as contrasted to the vast literature of American women's perception of sources of stress within their own culture.

Since for the foreseeable future, most deployments will be of multinational forces, the potential for cultural conflict as well as cultural enrichment is present. And to conclude this brief survey, it is worth noting that when I explained to an Army psychiatrist with considerable deployment experience what this chapter was supposed to be about, she said, clearly from experience, "Our army is in itself a multicultural force, and we do not know what we should about the web of cultural stressors we are involved with."

²People deployed to the first two areas could not find their manual to show me.

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Cultural Stressors During Deployment

**The Comparative Strength of Reported Stressors
For a Support Unit in
Operation Desert Shield/Desert Storm**

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The views of the author are not necessarily those of the Department of the Army or the Department of Defense (para. 4-3, AR 360-5).

Cultural Stressors During Operation Desert Shield/Desert Storm

Introduction

Cultural factors affecting the health and performance of soldiers during deployment may be less important than the unit contextual factors that any soldier, regardless of gender, experiences while deployed. To a great extent, leader behaviors and peer group relationships define the context of a unit. For example, the bonding that develops among soldiers and between soldiers and their leaders can provide a context that buffers unit members from external stress. In addition, cohesion at the level of the small work group seems important for the effective performance of any military unit, especially during an overseas deployment. At such times, the environment may be hostile and strange, and the familiar supports of home, family and friends exist at a distance. For any soldier, the context of one's unit may be a critical mediator, influencing the perception, rating and handling of stressful situations.

Currently, shifting requirements and evolving policy on both national and international levels result in multiple deployments for the military. For soldiers, these deployments are highly demanding, potentially dangerous, and frequently confusing and ambiguous. In such situations, the unit context may assume a more critical status in buffering a soldier from external stresses than would otherwise be the case. Delineating the variables that create the conditions for, or facilitate the development of, peer and leader bonding, rather than focusing on soldier differences, enables the identification of organizational influences that are possible to change. Therefore, any study of gender differences in soldiers' ratings of psychological status should include an assessment of their unit context as critical for mitigating or exacerbating psychological effects from exposure to stress. One approach to exploring such factors might be to hold cultural stresses and unit context constant by examining one particular battalion deployed to one particular location.

Method

Sample

The Department of Military Psychiatry of the Walter Reed Army Institute of Research collected data during and following Operations Desert Shield/Desert Storm. The research effort focused on Combat Arms units, with the objective to assess the stresses of combat and combat losses on units. Consequently, there were few female soldiers in the Combat Arms samples since they tend to concentrate in the Combat Service and Support units. However, a support battalion deployed to Operation Desert Storm from US Forces in Germany had the largest concentration of female soldiers in the data sets. Each of the battalion's four companies (A, B, C, and HQ) included some females. Company C had the smallest number of female soldiers (five), excluded during the preliminary analysis phase of demographic matching.

Figures 1 through 5 summarize the demographic data for the total sample at the battalion level. Data collected from soldiers in this battalion include 230 males (83%) and 48 females (17%). These soldiers are predominantly young, with approximately half (49.9%) falling in the 19 -24 years age range, and more than 80% of the soldiers 30 years of age or younger. More than half of the soldiers (51%) serve in the rank of E-4; 20% serve as E-1 - E-3; and 29% serve as E-5 - E-6. Approximately half of the soldiers in the battalion are White (53.4%), and 46.6% are Black, Hispanic or other. More than half of these soldiers (53%) are married, and approximately 46% are single, separated or divorced. Preliminary analyses attempt to control demographic variables and soldiers' experiences as unit members. The latter include such experiences as being in the same battalion, participating in the same deployment at the same time, and, for comparable subsets, being in the same company. Soldier ratings of unit cohesion and psychological status follow this initial stage of analysis.

Figure 1

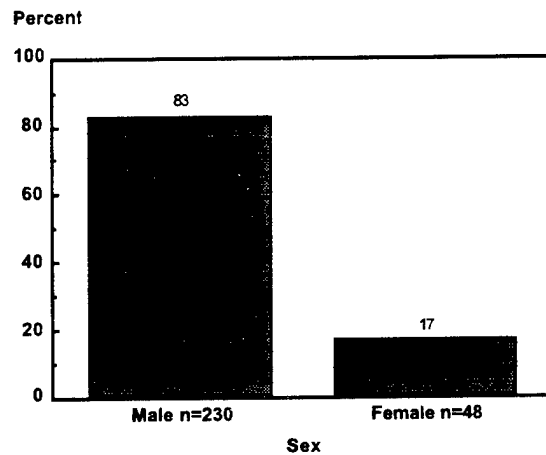
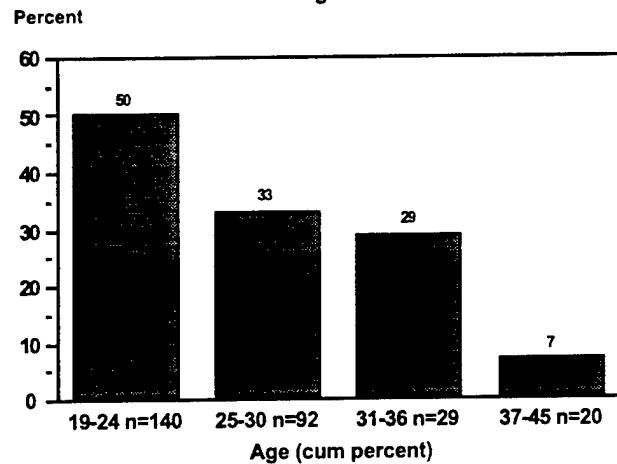


Figure 2



Cultural Stressors During Operation Desert Shield/Desert Storm

Figure 3

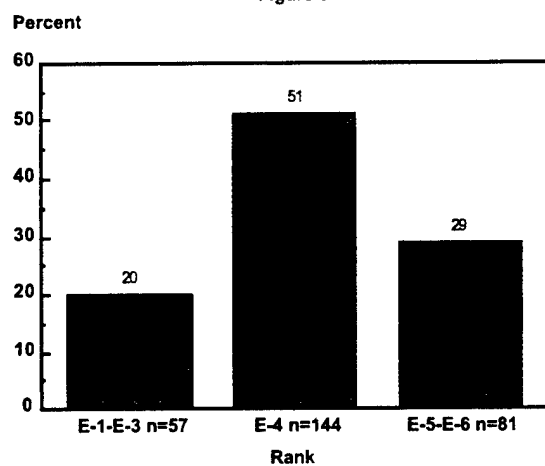


Figure 4

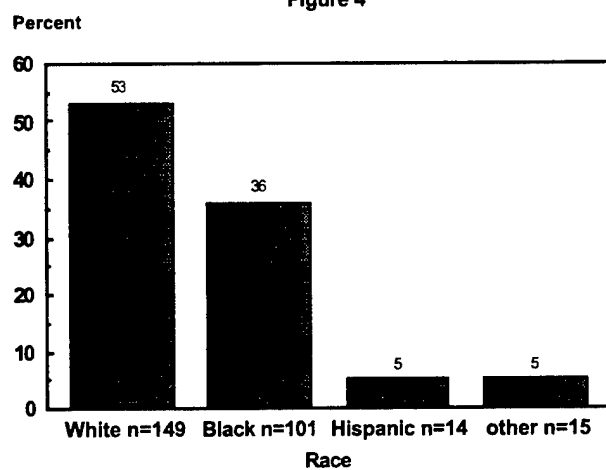
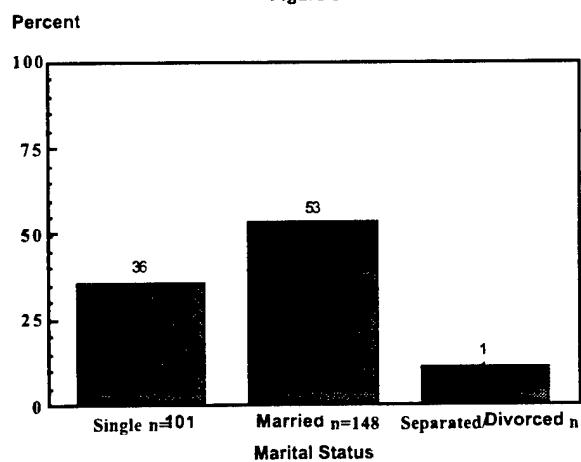


Figure 5



Instruments

The Operation Desert Storm research program used survey, interview and observation as the major data collection methods. The survey incorporated different scales and instruments based on evolving operational events. The survey administered to the support battalion deployed from Germany included demographic and military background information, ratings of unit cohesion, assessments of stress and coping, and two self-report scales rating psychological symptoms. For the purposes of this study, the three instruments referenced include the Cohesion Scale (Marlowe, et. al., 1985; 1986a, b, c; 1987), and two scales assessing psychological status: the Impact of Events Scale and the Brief Symptom Inventory.

The Impact of Events Scale (IES) is a 15 item scale frequently used to assess reactions to specific traumatic events (Horowitz, 1986; Horowitz, Wilner, & Alvarez, 1979; Horowitz, Wilner, Kaltreider, & Alvarez, 1980). Two dimensions reflect intrusive imagery and avoidance of stimuli, symptoms diagnostic of Posttraumatic Stress Disorder according to DSM-IV (APA, 1994). The two subscales demonstrate high internal consistency (Cronbach's alpha ranges from .79 to .92), across repeated measurements in time (test-retest reliability ranges from .86 to .90) (Zilberg, Weiss, & Horowitz, 1982).

The Brief Symptom Inventory (BSI) is a 53 item self-report scale of symptoms (Derogatis, 1993). Respondents rate the items on a 5-point scale of distress, ranging from "None" (0) to "Extreme" (4), using the past seven days as the time frame of reference. Both research and clinical practice use the BSI extensively and studies establish acceptable reliability and validity. The BSI includes nine symptom dimensions or subscales: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation and Psychoticism, as well as three global indices of psychological distress. Internal consistencies for the nine subscales, test-retest reliability, and the stability coefficient for the Global Severity Index are all within acceptable ranges (Derogatis, 1993).

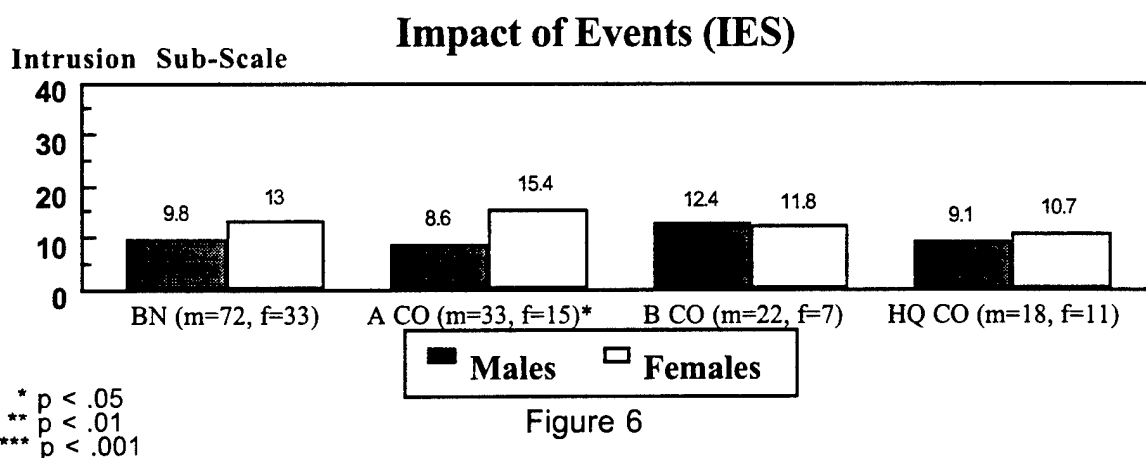
Preliminary Analyses

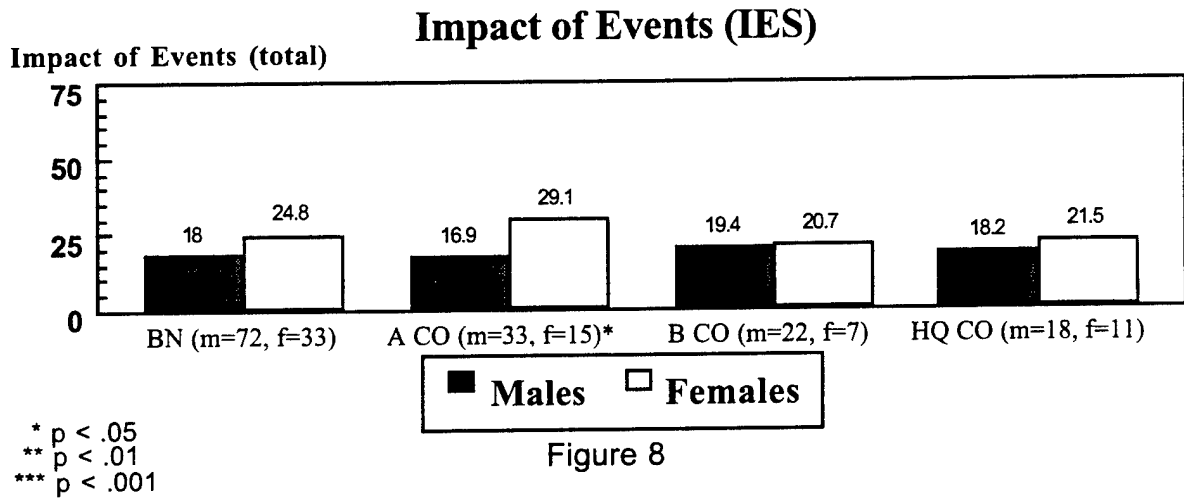
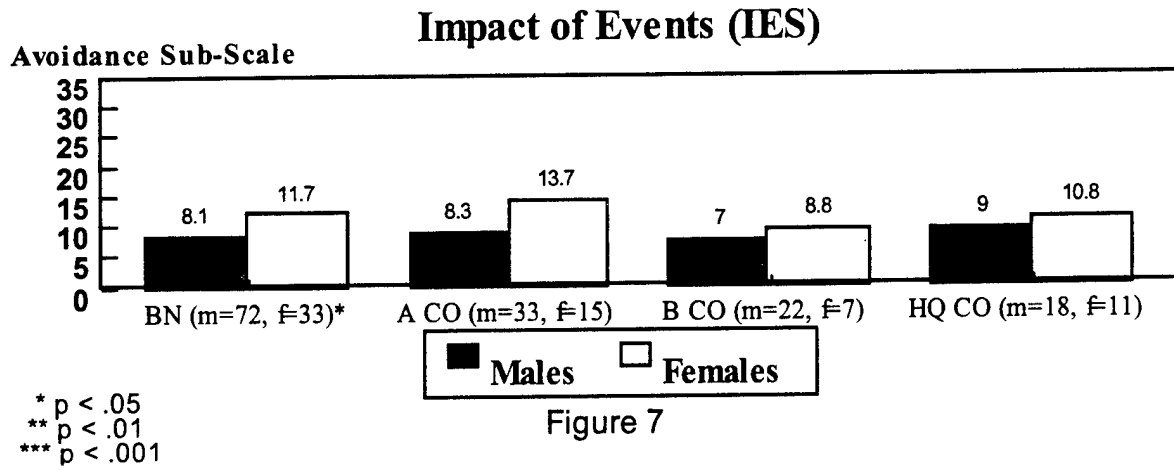
In order to assess whether soldiers' ratings of psychological symptoms relate to gender or to contextual factors, preliminary analyses selected male and female soldiers from the three companies in the battalion, controlling as much as possible for demographic differences. This occurred by holding the company variable constant (unit context), and matching male and female soldiers on ethnicity, marital status and age. Military rank and education are relatively constant. All soldiers serve as enlisted in E-1 to E-6 pay grades (Private to Staff Sergeant), and all soldiers have at least a high school education.

Following analyses that control as much as possible for demographic differences and unit experiences, a sample consisting of 73 males and 33 females remains, members of A, B and HQ Companies. Comparisons for male and female soldiers at the overall battalion level and at the company levels on ratings of unit cohesion include peer bonding (horizontal cohesion) and bonding to leaders (vertical cohesion). Ratings of psychological status include comparisons across groups for the nine subscales of the BSI, as well as the overall rating of psychological distress summarized by the General Severity Index (GSI). Comparisons on the Impact of Event Scale (IES), targeting the event to experiences in Operation Desert Storm, include the IES total score and the Intrusion and Avoidance subscale scores.

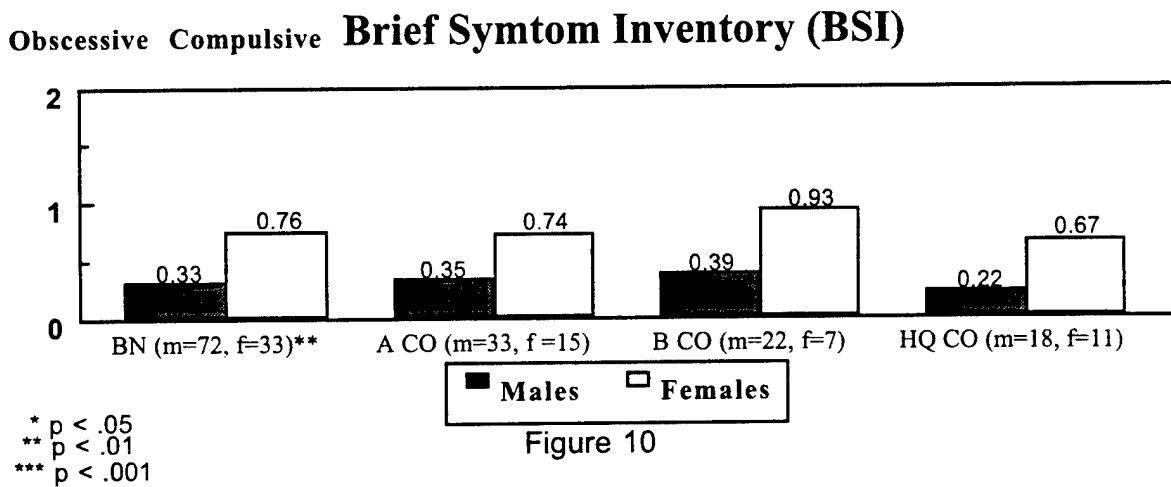
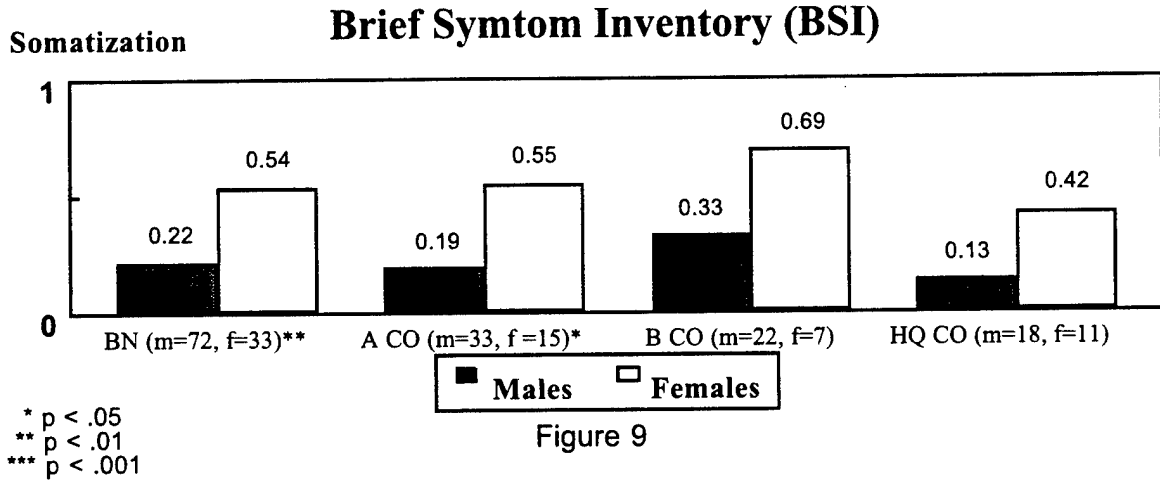
Results

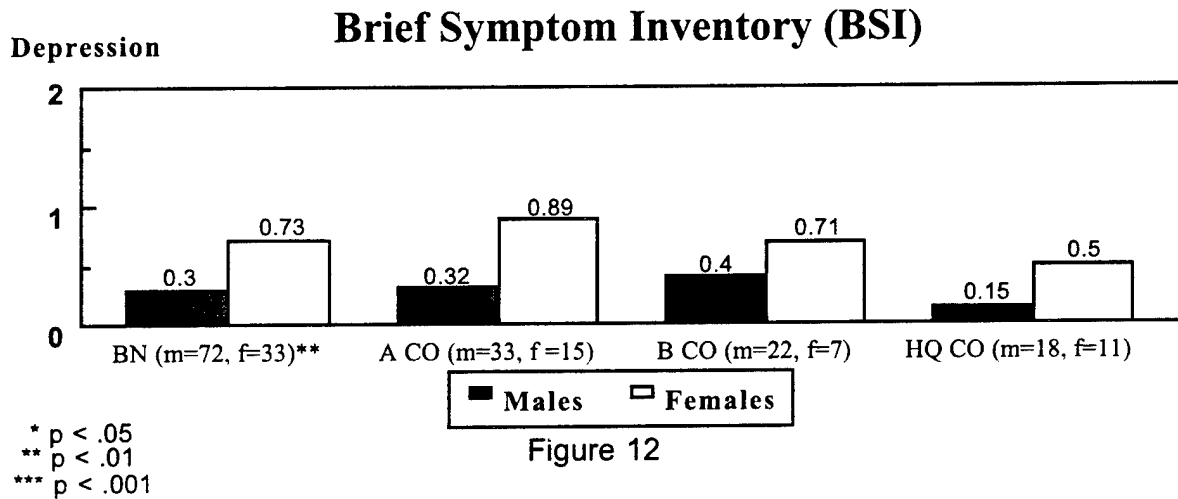
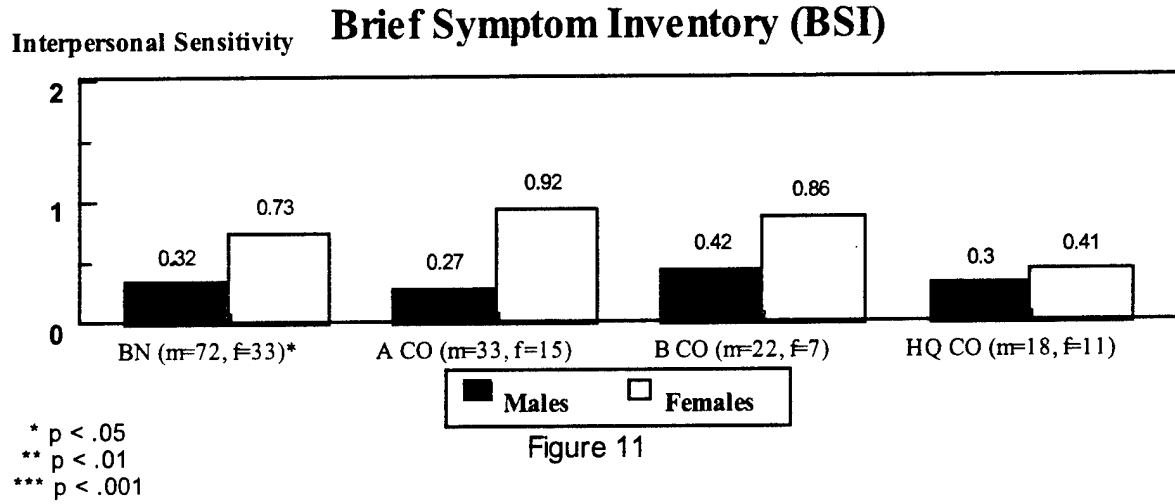
The figures below summarize the results for the support battalion. Each figure reflects gender differences in scores on the IES, the BSI and the Cohesion Scale. Each figure shows the mean scores and the significance levels for the overall battalion and the three selected companies. Figures 6 through 8 summarize the results on the IES. Female soldiers score significantly higher than male soldiers at the battalion level for the Avoidance subscale, and in A Company for the Intrusion subscale and the total score.

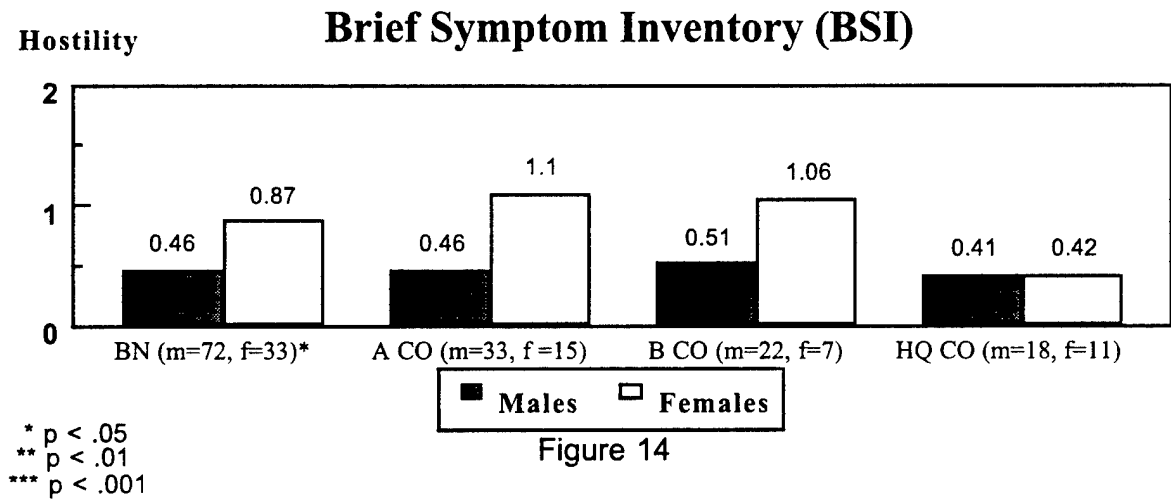
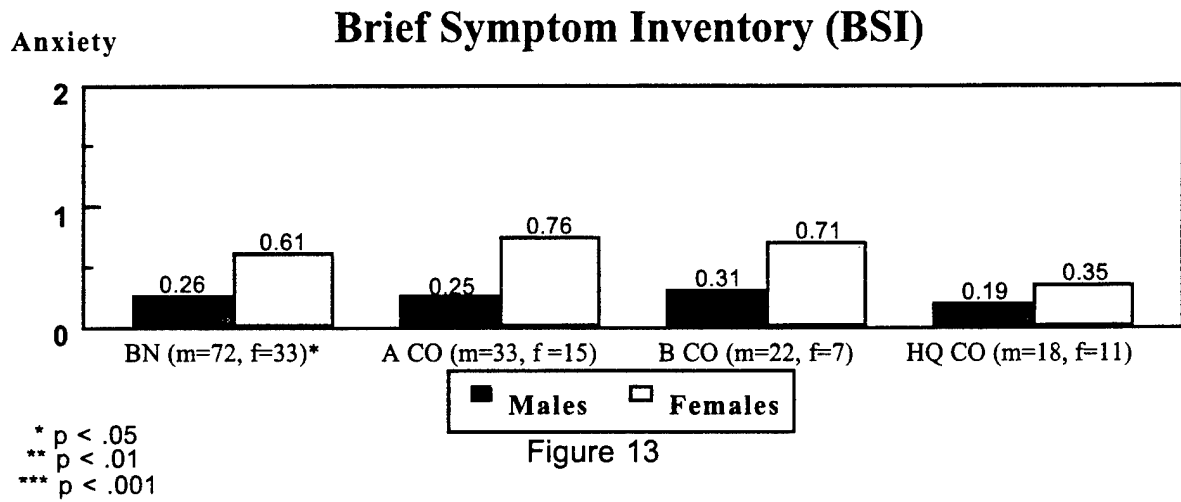


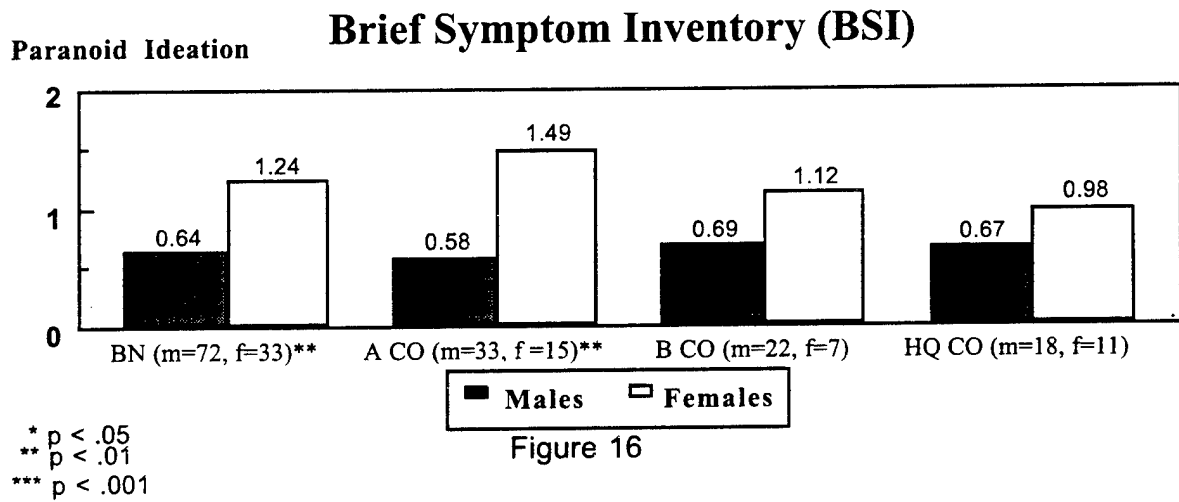
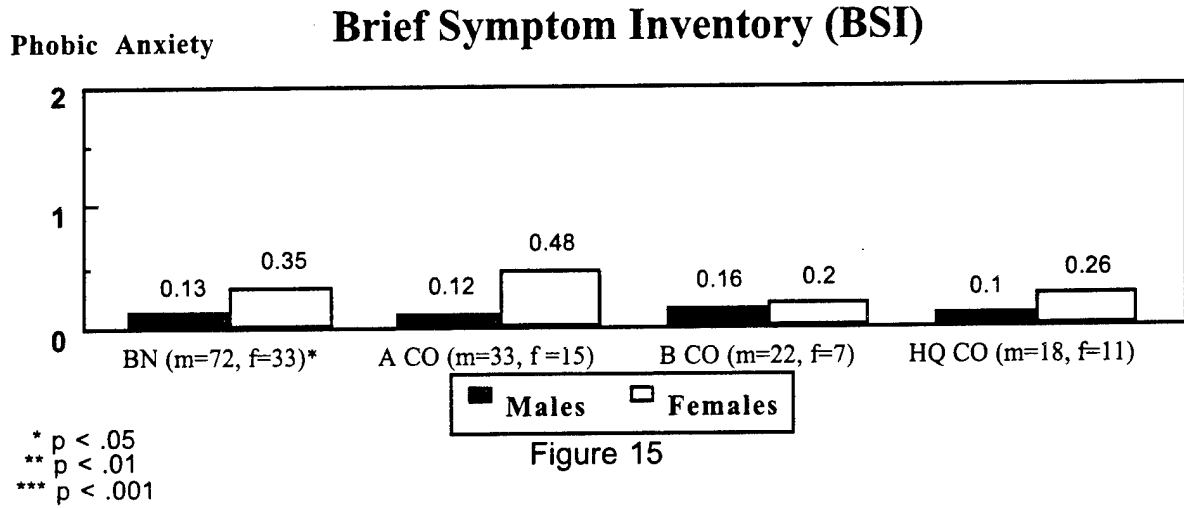


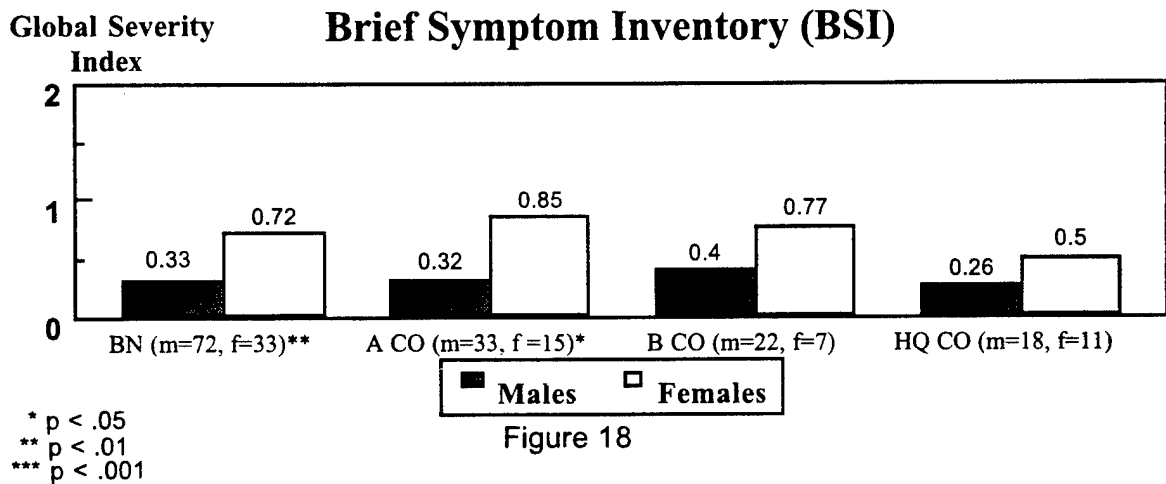
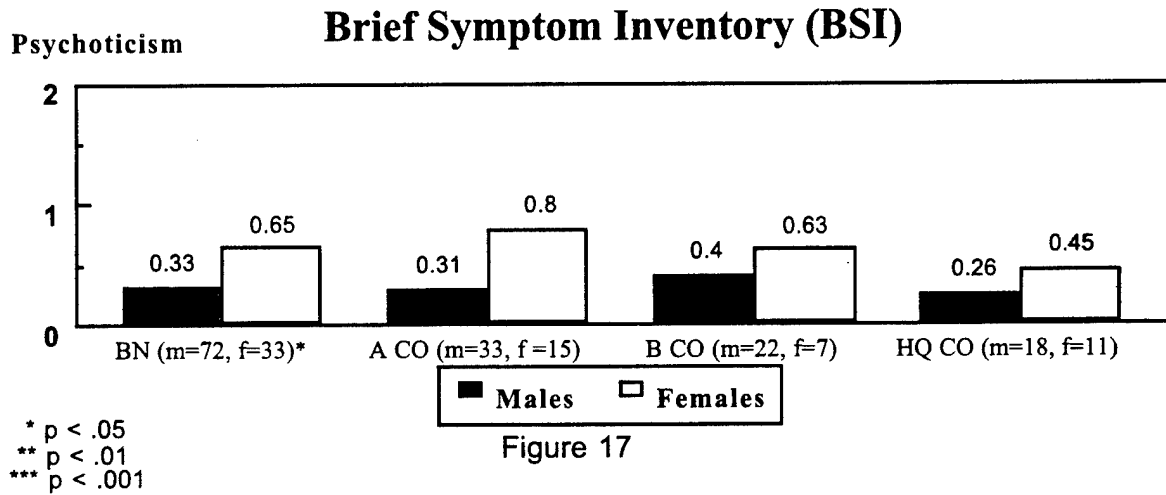
Figures 9 through 18 summarize the results on the BSI. The figures show mean differences and significance levels for each of the nine subscales and the GSI. At the battalion level, all BSI subscales and the GSI show gender differences, with females scoring significantly higher than males. However, at the company level, only Company A shows significant gender differences, with female soldiers scoring significantly higher than males on the Somatization and Paranoid Ideation subscales and on the GSI.



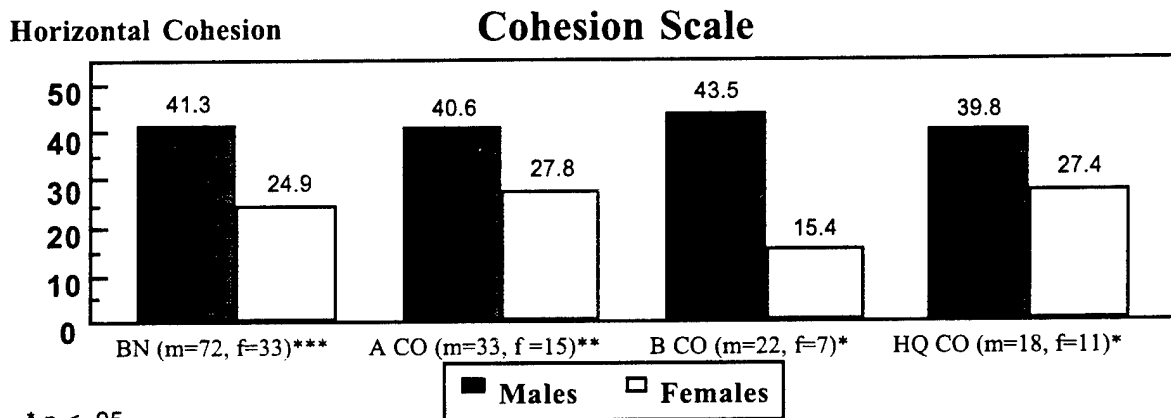






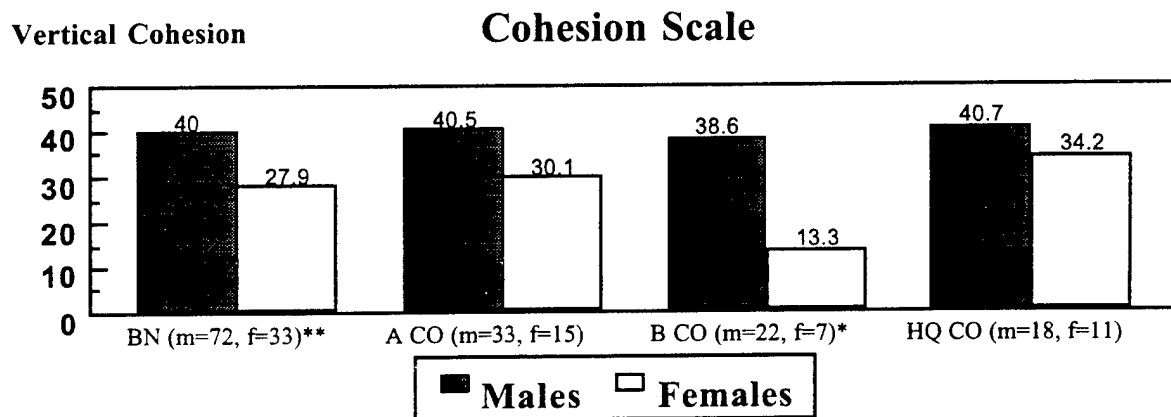


Figures 19 and 20 summarize the results on the Cohesion Scale. The figures show mean differences and significance levels for horizontal cohesion (peer group bonding) and vertical cohesion (bonding to leaders). At the battalion level, male soldiers overall score significantly higher than female soldiers on both vertical cohesion and horizontal cohesion. At the company level, males score significantly higher than females on horizontal cohesion across companies. In B Company, males score significantly higher than females on vertical cohesion.



* $p < .05$
 ** $p < .01$
 *** $p < .001$

Figure 19



* $p < .05$
 ** $p < .01$
 *** $p < .001$

Figure 20

Discussion

The results described above illustrate the complexity of considering organizational levels and contextual effects in studies concerning the stresses of deployment. At the battalion level, there are significant differences between male and female soldiers in their reporting of psychological symptoms. Overall, female soldiers rate psychological symptoms significantly higher than do their male counterparts. However, female soldiers rate horizontal and vertical cohesion in their units significantly lower than do the male soldiers in this battalion. This appears to support the recommendation to assess unit context in any study of military deployment stress. Soldiers who perceive themselves as members of a unit low in cohesion, with minimal bonding to either their leaders or to other group members, may also be those who perceive no buffer of support against the stresses of deployment. In the case of Operation Desert Storm, the stresses include an anticipated combat operation.

Further support for the "soldier in context" perspective comes from findings at the company level. Here, significant differences on symptom ratings for male and female soldiers virtually disappear. Only Company A shows gender differences on the Somatization and Paranoid Ideation subscales and on the GSI, with females in the company scoring significantly higher than males. Interestingly, female soldiers in Company A also score significantly higher on the Intrusion Scale and total score of the IES, consistent with research findings for post trauma stress reactions (Horowitz, 1986). It is difficult to know whether there is any connection between the elevated IES scores and their experiences in Desert Storm. However, we do know that respondents from Company A indicate Military Occupational Specialties (MOS) of Transportation, Police, and Heavy Security, which differ from the jobs in the other companies of the support battalion. Perhaps Company A's missions, given their specialties, involved greater exposure to forward positions during Desert Storm and subsequently greater exposure to casualties and prisoners of war.

Again focusing on context, an intriguing result in the company level comparisons concerns gender differences in cohesion ratings. As noted above, male soldiers rate the cohesion in their units significantly higher than do female soldiers in the same company. This finding holds across all companies for horizontal cohesion, the bonding between unit members. However, there are no significant differences between male and female soldiers in their ratings of vertical cohesion, the bonding between a group and its leaders, except in Company B. Looking at the actual mean cohesion scores for Company B, male soldiers rate both vertical and horizontal cohesion about the same as do male soldiers in the other companies in this battalion. Correspondingly, female soldiers in all companies, except Company B, have similar mean ratings on the cohesion measures. Only the female soldiers in Company B rate horizontal and vertical cohesion markedly lower than any other company (See Figures 19 and 20). This finding does not appear to be gender based since it does not occur in other companies. For some reason, female soldiers in Company B demonstrate a different pattern than do any of the other groups. The discrepancy indicates the need for additional contextual information in order to hypothesize possible causes.

Cultural Stressors During Operation Desert Shield/Desert Storm

Conclusion

The recommendation is to study the soldier in context rather than focusing on the differences between male and female soldiers. The unit context appears even more critical when it is the major place for the soldier, as in a deployment when it becomes a home away from home. In such situations, particularly if it includes isolation, austerity and danger, the primary protective buffer comes from those who are sharing the same circumstances. Not only are the other unit members a source of social support, but they also contribute to accomplishing the tasks of the deployment. They serve both an instrumental as well as an affective function.

Results from the support battalion provide preliminary information on soldiers' responses to the stresses of deployment and their perceptions about the status of their units.

Attempts to control as much as possible for demographic factors and unit experiences reveal that the more similar the context, the more similar the responses, regardless of gender. However, there are some puzzling discrepancies in these preliminary findings. For example, what happened in Company A where several psychological symptom scales indicative of post trauma stress reactions remain elevated? Why do peer group cohesion ratings remain relatively low across companies for female soldiers, whereas gender differences in ratings of bonding to leaders disappear? What situation or event occurred in Company B resulting in the lowest cohesion scores for female soldiers across companies for both peer group and leader bonding, but that left their male counterparts unaffected? The more detailed the focus on contextual factors, the greater the understanding and appreciation of the complexity of such analyses.

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III

Vulnerability and Resilience: Mental Health in a Military Context

**Anxiety and Phobic Disorders:
Sex Differences in Prevalence, Phenomenology, and Treatment Response**

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The opinions and assertions herein are those of the authors and are not to be construed as reflecting the views of the Uniformed Services University of the Health Sciences or the U.S. Department of Defense.

One thing is certain, that the problem of anxiety is a nodal point, linking up all kinds of the most important questions; a riddle, of which the solution must cast a flood of light upon our whole mental life.

Freud (1917/1963, p. 401)

Introduction

Anxiety is a ubiquitous phenomenon. It is estimated that billions of dollars are spent each year by individuals attempting to rid themselves of anxiety. More people visit physicians for anxiety than for colds (Marsland, Wood, & Mayo, 1976). Others have estimated that 30% to 40% of the general population has suffered from sufficiently high levels of anxiety that they would likely benefit from clinical intervention (Shepherd, Cooper, Brown, & Kalton, 1966). It has been argued that one of the reasons for the high prevalence of anxiety is the fact that the experience of anxiety is an innate, biologically-driven, protective response to threat (Barlow, 1988). As such, we all possess the capacity to experience fear in the context of dangerous situations. Our anxiety response, the so-called "fight/flight" response, is viewed as a protective mechanism to prepare us in the event of danger. Whereas each of us experiences anxiety, and many of us are significantly affected by anxiety at certain times, only a subset of individuals develop pathological levels of anxiety sufficiently distressing to meet the criteria of an anxiety disorder. In the following sections, three anxiety disorders will be considered in regard to sex differences.

Research on the nature and causes of anxiety and anxiety disorders has proliferated during the past decade. Thousands of studies have been conducted. This fervent activity has led to significant advances in our understanding of the etiology, diagnosis, and treatment of pathological anxiety. Yet, many questions remain relatively unexplored and unanswered. Our incomplete knowledge is particularly apparent in the area of gender-based differences in anxiety conditions. Despite the vast literature amassed on anxiety disorders, surprisingly little is known about sex differences. Thus, anxiety disorders are an especially apt topic for a volume that is concerned with examining sex differences.

In organizing the current chapter, our focus will be on three specific anxiety conditions -- panic disorder with and without agoraphobia, social phobia, and specific phobia. The "phobic disorders" are designated as such due to the behavioral avoidance that is central to their phenomenology. The rationale for our focus on these conditions is that they constitute a cluster of anxiety conditions that can be meaningfully separated from other anxiety disorders, such as post-traumatic stress disorder (PTSD) or obsessive-compulsive disorder (OCD). These disorders share similarities in their clinical presentation, purported etiological mechanisms, and responses to treatments. This chapter reviews work relevant to each phobic disorder. The principal questions that guided our considerations were the following: What is the amount and quality of previous work regarding sex differences in these conditions?; More specifically, are there sex differences in phenomenology, etiology, and response to treatment?; If sex differences

exist, what are the mechanisms underlying them?; Finally, what can be done to advance understanding of sex differences?

In addition to reviewing work on the specifically defined anxiety disorders, we have also included data from some of our own empirical investigations examining psychological factors that may contribute to the development of an anxiety disorder. An understanding of risk factors relevant to the development of anxiety disorders is perhaps one of the most important and interesting areas of work because of its potential impact on etiology and prevention. Unfortunately, long-term prospective studies are difficult to conduct. Relatively few studies have examined prospectively the development of anxiety conditions, and we are aware of no published studies that have specifically examined sex differences in the development of anxiety pathology. We present preliminary data from a prospective study of male and female cadets at the United States Air Force Academy that assesses gender as a risk factor for anxiety pathology.

Epidemiological Studies of Anxiety Disorders

In the 1980s, the National Institute of Mental Health sponsored a comprehensive epidemiologic study of anxiety disorders. The Epidemiological Catchment Area (ECA) study assessed thousands of individuals at five sites across the country. Prevalence estimates suggested that a much larger percentage of individuals suffered from anxiety conditions than was previously believed. These prevalence estimates so far exceeded expectations that many concluded that anxiety disorders represent the single greatest mental health problem in the country (Barlow, 1988).

In terms of specific prevalence estimates for the phobic disorders, the ECA study estimated a six-month prevalence for panic disorder to be approximately 1%, agoraphobia was estimated at approximately 4% (note that panic disorder and agoraphobia were diagnosed as separate conditions in the DSM-III), social phobia was estimated at 3%, and specific phobias were estimated at 7%.

It is interesting that substantial sex differences emerged from the ECA data. Although the lifetime prevalence estimates for panic disorder were approximately 2% for females and 1% for males, there were even more substantial sex differences for agoraphobia (8% versus 3%, respectively). Almost 75% of the diagnosed agoraphobics were female. There were also very large differences in diagnoses of specific phobia (6% versus 3%) as well as significantly greater numbers of females diagnosed with social phobia (2% versus 1%). Findings from the ECA study have been criticized on a number of grounds (McNally, 1994). However, the gender disparity for these phobic disorders has been replicated in a number of other studies. The general consensus is that women appear to be at much greater risk for the development of phobic conditions than men. In sum, epidemiological data call for more detailed examination of sex differences among phobic disorders.

Sex Differences in Phobic Conditions

Specific Phobias

Specific phobias are familiar to most people. They encompass any debilitating fear to "specific" objects or situations. Some of the more commonly reported fears include snakes, heights, flying, and enclosures (Agras, Sylvester, & Oliveau, 1969). However, specific fears do not necessarily result in a phobic disorder (see Table 1). For example, because snakes are relatively easy to avoid, fear of snakes does not lead to sufficient disability for most individuals. The most common phobias include illness/injury, storms, and animals (Agras et al., 1969). In each of these most common fears and phobias, females are overrepresented.

Table 1

Prevalence of Fears and Specific Phobias in Males and Females

Fear	Prevalence per 1,000 population	Sex	
		M	F
Snakes	53	118	376
Heights	120	109	128
Flying	109	70	144
Enclosures	50	32	63
Illness	33	31	35
Death	33	46	21
Injury	23	24	22
Storms	31	9	48
Dentists	24	22	26
Illness/Injury	31	22	39
Storms	13	0	24
Animals	11	6	18
Death	5	6	4
Crowds	4	2	6
Heights	4	7	0

Adapted from Agras et al. (1969).

Prevalence and phenomenology. Epidemiological estimates suggest that women are at an increased risk for phobias as compared to men, the incidence of phobias being, on average, 5.9 out of 100, with 8.0 out of 100 for women and 3.4 out of 100 for men (Holt & Heimberg, 1993). Data from the ECA study indicate a pattern of sex

differences among phobic subjects that is evidenced by six-month prevalence as well as lifetime prevalence rates. In terms of six-month prevalence rates, women appear to have 1.5 to 2 times greater risk for specific phobia (Myers et al., 1984). Lifetime prevalence rates showed a somewhat larger gender difference, ranging from 1.75 to 2.5 greater risk for women (Robins et al., 1984).

Specific phobia is a heterogeneous diagnostic category. Substantial sex differences have been reported for certain specific phobias. Animal phobias show the greatest sex differences, with 75% to 95% females among those diagnosed (Ackerman, 1982; Cameron & Hill, 1989; Barlow, 1988; Himle, McPhee, Cameron & Curtis, 1989). Similarly, females comprise 55 - 70% of those with blood/injection/injury phobias and acrophobia (Barlow, 1988). Phobias involving storms, choking/vomiting, and school have also been found to be more prevalent among females (Himle et al., 1989, Atkinson et al., 1985).

Not all specific phobia data are consistent with sex differences. Some studies using self-report measures of phobia failed to find significant sex differences (Osman, Barrios, Osman & Markaway, 1993). For example, Thyer et al. (1985) administered the Fear Survey Schedule to psychiatric patients and found that females did not report significantly different fears from males. Studies examining the existence of new phobias (e.g., computer phobia) have found no sex differences (Rosen & Magure, 1993). It may be that study methodology (self-report measures versus diagnostic interview) accounts for these different findings. Further evaluation of sex differences using a multimethod approach is necessary to clarify this issue.

Although there is considerable research establishing sex differences, we could find only one study investigating sex differences in course or phenomenology. A descriptive survey-based study by Hallum (1985) suggested that phobic avoidance among females is associated with the following factors: (1) higher levels of education, (2) being single, and (3) having fewer children.

Treatment response. Several studies have examined sex differences in treatment outcome for psychotherapy interventions. These reports found that females with specific phobias have a poorer prognosis than men (Ackerman, 1982; Burrows et al., 1992). Females report a greater number of symptoms and more phobic avoidance at follow-up (Burrows et al., 1992). However, Burrows reported that females showed a higher incidence of comorbidity with other Axis I disorders (i.e., affective disorders) which may account for poorer treatment response. The finding of poor treatment response raises treatment issues in designing therapies for women with specific phobias. Although behavioral treatment utilizing exposure is generally effective in treating patients with phobias, Ackerman (1982) suggested that female phobics are less able to endure the phobic stimulus relative to male phobics, an important consideration for therapists using exposure techniques with females. Clearly, more outcome research is needed to evaluate sex differences and the differential efficacy of psychosocial and pharmacological interventions.

Explanations for sex differences in specific phobia. Why do women seem to be more prone to specific phobias than men? The literature presents several hypotheses, which generally implicate sociocultural factors (Hallam, 1985). Some have suggested that, according to traditional sex role stereotypes, it is more socially acceptable for a woman to be phobic (Chambless, 1988; Hugdahl, 1989). Similarly, some have posited that phobia in females is an exaggerated extension of the helpless, passive, fearful, dependent stereotype, which may predispose women to being excitable and submissive, and further exacerbate the phobic response (Ackerman, 1982). Others have suggested that the sex differences evidenced in epidemiological reports may be due simply to reporting biases, i.e., males and females may have similar fears but females may be more apt to disclose their fear and avoidance because it is more socially acceptable to do so.

Physiological and developmental factors have also been implicated in sex differences in the development of phobias. Chambless (1988) suggested that women may be more fearful than men due to differences in exposure to reproductive hormones and their effects during development. Gray (1987) found a relationship between hormone levels and timidity in infants. During infancy, low levels of testosterone and higher levels of estradiol are related to increased timidity. Unfortunately, we are unaware of studies that have directly tested hormonal effects in the development of specific phobias.

Summary and future directions. There is a considerable body of evidence suggesting a substantially increased prevalence of specific phobias among women. In fact, specific phobia ranks as the third highest psychological concern among females, and only the seventh highest concern among males (Ackerman, 1982). Little is known about differential etiological mechanisms in women and men, or about sex differences in the phenomenology or expression of specific phobias. There are some data to support poorer treatment outcome for females suffering from specific phobias. We recommend the following directions for future research:

- (1) Evaluation of specific biochemical, genetic, and psychological factors that may contribute to the development of specific phobias;
- (2) Evaluation of sex differences in the expression and course of specific phobias;
- (3) Evaluation of factors that may moderate or mediate sex differences in treatment outcome.

Social Phobia

Fear in social situations is common. Social phobia is an exaggeration of this reaction in any circumstance in which the individual becomes subject to the scrutiny of others. The most common type of social phobia is public speaking. However, many social phobics display more generalized concerns in any social interaction, including eating in a public restaurant, signing a check in front of others, or using a public restroom. At the core of each of these feared behaviors lies a concern about social evaluation.

Prevalence and phenomenology. The prevalence of social phobia in terms of gender ratio appears to differ according to the type of population being studied. Prevalence of social phobia within inpatient populations is often found to be higher for males, whereas there tends to be a greater prevalence for females if community surveys are used (Wells, Tien, Garrison, & Eaton, 1994). Using community data from the ECA study, Wells et al. (1994) reported more than double the risk of social phobia for women than men. Separate analysis by gender revealed that the incidence of social phobia increased with age for women, but showed no changes for men. In an Icelandic survey, Stefansson (1993) reported 2 to 1 female to male ratio for all anxiety disorders, but found a nonsignificant difference in lifetime prevalence of social phobia between men and women. In a more recent report, Judd (1994) reported a lifetime prevalence of 13.3% for social phobia, with a 2.5 to 1 female to male ratio. Interestingly, a study of a clinical population by Marks (1985) found the prevalence of social phobias was approximately equal in men and women when individuals with more generalized social skills deficits were excluded. There is some debate in the literature regarding the separation of social phobia from those with more pervasive, trait-like social anxiety who may be better classified as having a personality disorder (i.e., Avoidant Personality Disorder). It is likely that prevalence estimates will vary considerably until these distinctions are delineated more clearly in the classification system.

Explanations for sex differences in social phobia. It is important to highlight methodological issues that may be contributing to the inconsistencies in prevalence estimates across studies of social phobia. Two relevant considerations include: (1) the different reporting patterns between clinical and community populations, and (2) reporting biases between the sexes (Cameron & Hill, 1989).

Careful consideration should be given to the type of study methodology (i.e., community/epidemiological versus clinical samples). As noted above, community and clinic-based studies often yield disparate prevalence estimates. Large community studies may provide a more reliable estimate of general prevalence because many patients with significant pathology never seek out mental health services. In contrast, epidemiological studies are frequently criticized for diagnostic reliability (Cameron and Hill, 1989). Reporting bias may also differ depending on study methodology. Anonymous community surveys may lead to more reliable reporting for males, who are believed to underreport pathology. However, the effects and extent of reporting biases have not been studied adequately.

Diagnostic classification of social phobia also affects prevalence estimates. A consistent deficiency in studies of social phobia and gender is that no classification is made in terms of generalized social phobia (i.e., fear of many situations) versus specific social phobia (i.e., public speaking). This distinction, or lack thereof, may be particularly important in studies involving sex differences. Although the societal roles of males and females become more similar over time, significant differences continue to exist in terms of role expectations. For example, a male executive may feel extreme pressure to speak with composure in front of a group, whereas a female executive may feel pressured to "fit in" with colleagues and therefore exhibit more generalized social evaluation fears.

Summary and future directions. Some epidemiologic data suggests a higher prevalence of social phobias among females. Other data, on clinical samples, yield less clear-cut prevalence differences. Of all the phobic conditions, perhaps the least is known regarding differential gender influences on etiological mechanisms, phenomenology, or treatment of social phobia. We recommend the following directions for future research:

- (1) Evaluation of sex differences in the prevalence and phenomenology of generalized versus specific social phobia and Avoidant Personality Disorder;
- (2) Evaluation of sex differences in the phenomenology of these disorders in clinical samples (i.e., patients seeking treatment);
- (3) Evaluation of sex differences in biopsychosocial factors that may underlie concerns about social evaluation and social phobia.

Panic Disorder With and Without Agoraphobia

Panic disorder is an anxiety condition characterized by discrete episodes of spontaneous and intense fear. These episodes, so-called "panic attacks," consist of a variety of autonomic symptoms such as tachycardia, paresthesias, dyspnea, and dizziness, as well as cognitive symptoms including fear of dying or losing control. After experiencing one or more of these panic attacks, patients anticipate and fear their recurrence. Thus, it is often said that panic disorder is a "fear of fear" because fear of having more panic (i.e., autonomic arousal) is evident among all panic disorder patients, even though there are considerable individual differences in the symptomatic expression of the disorder. Often, dramatic steps are taken to avoid situations that have led to panic attacks. When avoidance is significant, the panic disorder patient receives the additional diagnosis of agoraphobia. Agoraphobia is simply phobic avoidance of any situation or circumstance that the patient believes may lead to panic attacks, or in which escape may be difficult should a panic attack occur.

Prevalence and phenomenology. As reported above, prevalence rates for panic disorder show an interesting gender-based pattern. ECA data suggest sex differences in lifetime prevalence of panic disorder, with approximately twice the rate for females as for males. However, there are significantly greater numbers of females among those panic disorder patients with phobic avoidance.

Other descriptive studies have reported substantial sex differences in terms of phobic avoidance. For example, Himle et al. (1985) found that 80% of agoraphobics were female. In this same study, only 57% of panic disorder patients without agoraphobia were female. Two additional studies have found a greater percentage of females than males in categories of more extensive avoidance (Reich, Noyes, & Troughton, 1987; Sanderson, Rapee, & Barlow, 1987). For example, Sanderson et al. reported that 89% of the severe agoraphobics were female.

Apart from sex differences in phobic avoidance, we could find no studies comparing males and females on other demographic or clinical indices. We present data from a sample of 121 (33 = male, 88 = female) patients with panic disorder who participated in treatment outcome studies at the University of Texas at Austin (Schmidt & Telch, 1996).

As can be seen in Table 2, there were no sex differences on any of the demographic variables including ethnicity, marital status, education, employment status, or history of treatment ($p > .05$). Examination of clinical variables revealed that, as expected, that females showed greater levels of phobic avoidance. It is notable that this is only true when the patient is alone (versus accompanied), suggesting that the presence of a "safe" person allows females to tolerate their anxiety in situations they typically would avoid. There were no sex differences in panic severity, general levels of anxiety, or overall self-reported impairment. There was a trend suggesting that females were less depressed than males ($p = .10$). Assessment of cognitive factors indicated no differences in fear of fear. There was a trend suggesting that females believed they could cope less well with a panic attack ($p = .09$) but no differences in the perceived likelihood or consequences of panic. However, overall, females reported a significantly greater number of panic-related cognitions ($p < .01$). It would be interesting to determine whether some of these cognitive phenomena would also be evident in measures of information processing. There are substantial data to suggest information processing biases in patients with panic disorder (McNally, 1994), but sex differences in these biases have not been assessed.

Sex differences in agoraphobia. Striking sex differences in agoraphobia have led to a variety of hypotheses: (1) It is more culturally acceptable for women to report fear. Men are expected to be "tougher" and therefore are less apt to report their anxiety; (2) Similarly, it is more culturally acceptable for women to act on their fears by avoiding, but men are expected to be brave. This will lead to exposure to fear provoking situations and, consequently, will allow men's fears to habituate; (3) There are no underlying differences in panic attack frequency. Women cope with anxiety through avoidance, whereas men may be finding different ways to cope with panic, such as alcohol use or abuse; and (4) Biological factors mediate sex differences. For example, endocrine fluctuations may predispose females to panic, and consequently, to develop agoraphobia.

Evidence for the sociocultural hypotheses is difficult to assess due to a lack of empirical investigations. There is some limited evidence that male patients with panic disorder may use alcohol at greater rates than females (Barlow, 1988). There is, however, no evidence to suggest that alcohol or drug consumption allows males to confront fear-provoking situations or that males "substitute" drinking for avoidance. In terms of biological mechanisms, Barlow's (1988) summary of the literature indicates that hormonal fluctuations do not appear to predict panic attacks or phobic avoidance.

Table 2

Comparison of Male and Female Panic Disorder Patients on Demographic and Clinical Variables

Variable	Male (N = 33)	Female (N = 88)
Age (yr)		
Mean	33.2	36.2
SD 9.2	9.9	
Ethnicity (%)		
Caucasian	87.9	86.4
Marital Status (%)		
Never Married	24.2	21.6
Married	39.4	54.5
Divorced/separated	36.4	23.9
Education (%)		
High school or less	26.5	24.3
Part college	47.0	40.6
College grad or beyond	26.5	35.1
Employment status (%)		
Employed	69.7	60.2
Not Employed	24.3	37.5
Student	6.0	2.3
Prior Treatment (%)	21.2	19.3
Prior Hospitalization (%)	18.2	19.3
Panic Frequency (past month)		
Mean	8.0	12.1
SD	5.4	12.5
Anxiety (SPRAS)		
Mean	57.8	62.6
SD	28.5	25.3
Phobic Avoidance (FQ)*		
Mean	14.9	19.3
SD	7.7	8.4

Table 2 (continued)

Phobic Avoidance (MI) - Alone*		
Mean	2.7	3.2
SD	0.7	0.8
Phobic Avoidance (MI) - Accompanied		
Mean	2.2	2.3
SD	0.7	0.7
Fear of Fear (ASI)		
Mean	37.3	37.7
SD	11.5	10.6
Impairment (SDS)		
Mean	4.1	4.1
SD	1.0	0.8
Panic-related Cognitions (ACQ)*		
Mean	2.1	2.4
SD	0.6	0.6
Panic Appraisals - Likelihood (PAI-L)		
Mean	48.6	52.6
SD	19.9	22.0
Panic Appraisals - Coping (PAI-C)		
Mean	31.8	26.1
SD	18.2	15.9
Depression (BDI)		
Mean	19.2	16.2
SD	10.8	8.0

Note. SPRAS = Spielberger Patient Rated Anxiety Scale, FQ = Fear Questionnaire, MI = Mobility Inventory, ASI = Anxiety Sensitivity Index, SDS = Sheehan Disability Scale, ACQ = Agoraphobic Cognitions Questionnaire, PAI = Panic Appraisal Inventory, BDI = Beck Depression Inventory.

* $p < .01$.

We are aware of two studies that compared male and female patients with panic disorder to determine psychological factors that might account for differences in phobic avoidance. The most comprehensive study of this type evaluated over 400 patients and found relatively few differences on a wide range of measures of psychopathology and personality (Chambless & Mason, 1986). These general findings were replicated in a smaller study (Mavissakalian, 1985). Perhaps the most substantial finding from the Chambless and Mason study was that scores on a measure of masculinity/femininity were associated with avoidance, such that more "feminine" scores were associated with greater avoidance in both men and women.

Several psychological variables have been found to be associated with phobic avoidance: anxiety sensitivity and panic-related appraisals. Anxiety sensitivity refers to fear of the autonomic arousal associated with panic attacks. Panic appraisals are the specific predictions that patients with panic disorder make about the likelihood and consequences of experiencing a panic attack. We investigated whether these psychological variables mediate the relationship between gender and agoraphobia. It was predicted that both anxiety sensitivity and panic appraisals would be associated with phobic avoidance. Furthermore, it was hypothesized that these psychological constructs would mediate the relationship between gender and agoraphobia.

Forty patients (female = 24, male = 16) with panic disorder were assessed at the Uniformed Services University of the Health Sciences (USUHS) on measures of phobic avoidance, anxiety sensitivity, and panic appraisals. Consistent with our prediction, females were significantly more likely than males to receive an agoraphobia diagnosis (83% versus 37%). Similarly, gender was associated with phobic avoidance as indexed by self-report. In order to test for the potential mediating influence of the psychological variables, we first examined the relationships between anxiety sensitivity, panic appraisals and phobic avoidance. These analyses indicated significant associations between anxiety sensitivity and phobic avoidance ($r = .40$), as well as between panic appraisals and phobic avoidance ($r = .63$). In addition, female gender was associated with higher levels of anxiety sensitivity ($r = .33$) and panic-related appraisals ($r = .27$).

It is notable that sex differences in anxiety sensitivity were not found in the University of Texas (UT) sample. This discrepancy may be due to a range restriction problem. The UT sample exhibited significantly higher levels of phobic avoidance and anxiety sensitivity, with less variation in scores in comparison to the USUHS sample. Analysis of the data from the USUHS sample confirmed our predictions regarding mediation. Simultaneous prediction of phobic avoidance by both gender and each psychological construct indicated that only the psychological variables predicted avoidance while the association between gender and agoraphobia was reduced substantially. These findings suggest that anxiety sensitivity and panic-related appraisals may underlie the sex differences that have been documented for agoraphobia.

Treatment response. We are unaware of any published treatment outcome study that assessed sex differences. The UT sample described above participated in a 12 session cognitive behavioral treatment protocol (see Telch et al., 1993 for a description of the intervention). Variables representing the change following treatment were created for

relevant clinical outcome measures, including panic frequency, panic-related fear, phobic avoidance, anxiety sensitivity, and depression. In addition, an overall composite outcome variable was calculated based on scoring within the normal range of functioning on each of the individual outcome variables. Analyses examining the effects of group status (cognitive behavioral treatment versus waitlist) and gender (male versus female) indicated no effects for Gender in predicting any of the outcome measures. This study suggests that females and males respond similarly in the context of a skill-based psychosocial intervention.

Summary and future directions. Women appear to be at greater risk for the development of panic disorder, and are particularly at risk for the development of panic disorder with agoraphobia. Traditionally feminine gender roles, anxiety sensitivity, and panic-related appraisals may account for the differentially higher rates of phobic avoidance among women. Apart from agoraphobic avoidance, there appear to be few sex differences in the expression of the disorder or in response to cognitive-behavioral treatment. We recommend the following directions for future research:

- (1) More comprehensive evaluation of the singular and combined effects of biochemical, genetic, and psychological factors that may contribute to sex differences in the development of phobic avoidance;
- (2) Evaluation of sex differences with regard to cognitive factors including panic-related appraisals and information processing biases;
- (3) Evaluation of sex differences, and factors that may moderate or mediate sex differences, in somatic treatments.

Sex Differences, Vulnerability, and the Development of Anxiety

Stressors are ubiquitous, and individual responses to stressors are diverse. Most individuals adapt to typical stressors but, individual vulnerabilities and stressor severity together predict adaptation to the stress. For example, empirical studies have demonstrated that gender is a general risk factor, as females show greater reactivity to stressors (Baum & Grunberg, 1991), yet the consequences of this greater reactivity is not yet clear. Common responses to stress are the development of physical and mental symptoms that, in extreme forms, manifest in psychiatric disorders and physical disability. At present, our understanding of the psychological mechanisms underlying the adaptation process are limited. Very few studies have prospectively evaluated healthy individuals to determine psychological risk factors leading to failure to adapt to high stress situations.

Risk factors for the development of psychopathology have rarely been studied using prospective designs. One psychological variable that has been implicated in the development of anxiety pathology is anxiety sensitivity. Anxiety sensitivity refers to

fears of anxiety symptoms that are based on beliefs that these symptoms have harmful consequences. This dispositional variable is empirically and conceptually distinct from trait anxiety, is strongly associated with anxiety conditions, and may be a risk factor for anxiety disorders. For example, Maller and Reiss (in press) found that 1984 Anxiety Sensitivity Index (ASI) scores predicted the occurrence of anxiety disorders in 1987. In contrast to subjects with low ASI scores in 1984, those with high scores were five times more likely to have developed an anxiety disorder during a follow-up period of 36 months. These findings indicate that elevated anxiety sensitivity may be a risk factor for panic, but the small sample size precludes definitive conclusions.

We report here preliminary data from a study conducted on cadets at the United States Air Force Academy. As were Maller and Reiss (in press), we were interested in examining whether anxiety sensitivity predicted the development of anxiety pathology. In particular, we were interested in the development of spontaneous panic attacks. One of the unique features of the study is the evaluation of young, healthy adults in the context of a relatively extreme stressor on undergoing basic training upon entry to the Academy. No published studies have examined the development of psychopathology using such a design. In fact, we are aware of only one study that evaluated risk factors in the development of anxiety pathology prospectively (Maller & Reiss), and none that have examined the interrelationship between gender and the development of psychopathology.

In this study, we examined the interrelationships among gender, vulnerability factors (i.e., anxiety sensitivity), and the development of psychopathology in the context of a five-week basic training exercise. Approximately 1100 cadets (male = 898, female = 256) were assessed prior to and following basic training. We hypothesized that female cadets would show increased incidence of anxiety at the post-basic training assessment period, and that anxiety sensitivity would predict anxiety pathology at the post-training assessment period. We also predicted an interaction between gender and anxiety sensitivity, such that females with high anxiety sensitivity would respond to basic training with significantly greater anxiety compared to males with high anxiety sensitivity.

Change in anxiety symptomatology and the incidence of spontaneous panic attacks were the outcome variables of interest. Analyses examining the main effects of gender and anxiety sensitivity as well as their interaction were used to predict psychopathology. Consistent with our prediction, female cadets showed higher levels of anxiety symptoms during basic training as well as less reduction in anxiety symptoms at the post-training assessment ($p < .001$). Female cadets generally showed the same frequency of spontaneous panic attacks when controlling for history of panic (males = 7%, females = 9%). Anxiety sensitivity also predicted changes in anxiety ($p < .0001$) and panic attacks ($p < .01$). Contrary to our prediction, the anxiety sensitivity scores did not differentially predict anxiety pathology after treatment in women and men.

These preliminary data suggest that gender is a risk factor for the development of anxiety pathology during acute biopsychosocial stressors, such as basic training, in a young, healthy population. Follow-up studies are needed to define sex differences in the long-term course of anxiety pathology in the accommodation to stressors.

General Commentary

Anxiety and anxiety disorders are prevalent and potentially very debilitating. Some reports have found that quality of life for those experiencing clinically significant anxiety pathology is as dramatically affected as for those with major nonpsychiatric medical conditions such as cancer (Telch, Schmidt, Jaimez, Jacquin, & Harrington, 1995). Epidemiological reports have consistently found a higher prevalence of phobic conditions among women than among men. Women appear to be particularly overrepresented in certain conditions, including specific phobias and panic disorder with agoraphobia. These facts alone highlight the importance of understanding the nature of sex differences in anxiety.

Unfortunately, our understanding of sex differences in anxiety is limited. If gender is a risk factor for the development of anxiety pathology, what are the mechanisms that account for this? Biological, psychological, and sociocultural theories have been put forward, but these theories largely remain untested. Some investigations from our laboratory at USUHS suggest that two psychological constructs, anxiety sensitivity and panic-related appraisals, may mediate sex differences in phobic avoidance. However, further work is needed to develop a clear understanding of the variables that underlie these sex differences.

There are also very few studies that have directly examined sex differences and treatment outcome. Some reports have found a poorer outcome for females than for males, whereas others have found no differences. A lack of studies, and the ambiguity of findings from existing studies, warrants further outcome evaluations.

In sum, sex differences in phobic conditions are fairly well-established but much remains to be explored. We have made specific recommendations for areas that have received little attention, or those which may hold particular promise. For example, estimates of prevalence of social phobia remain somewhat unclear due to changes in the diagnostic system. In addition, little work has addressed the mechanisms that account for the dramatic sex differences in agoraphobia. We hope that this chapter will inspire and guide future work in this important area.

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Posttraumatic Stress Disorder In Military Women

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The opinions and assertions herein are those of the authors and are not to be construed as reflecting the views of the Uniformed Services University of the Health Sciences or the U.S. Department of Defense.

"She in field did appear
with a heart void of fear,
and she bravely, she bravely
did charge and give fire.
While the battering balls,
did assault the strong walls."

The Women Warrior
Dugaw, 1989 (p. 115)

My army service really opened my eyes to what women were all about, made me realize the breadth and depth and intellectual capacity, as well as nurturing capacity, and all the other things that women have. I think that was a marvelous experience. What if I had gone through life without ever knowing this? It would have been a disaster.

Mary Elizabeth Morse Brown, who joined the Women's Army Corps in 1943, in which she served as a second lieutenant (Houtchens & Henry, 1995)

Introduction

The psychological sequelae of trauma are profoundly influenced by the meaning that each individual attributes to the experience. To be comprehensive, a review of the vulnerability and resilience of military women to stress they encounter in their service must address multiple issues, including the effect of warfare on psychological health of all members of the population, differential effects on men and women, and the changing perception over time attached by the society at large to the inclusion of women in a duty traditionally confined to men. The changing pattern of deployment of women in the armed forces provides an opportunity to broaden this perspective, and to increase our understanding of the effects of warfare and military service on both men and women alike.

The function of the armed forces in a society governed by democratic traditions is to defend themselves against the horrific prospect of being invaded, occupied, and pillaged by their enemies. Therefore, service in the armed forces is likely to produce psychological stress for both men and women. Of necessity, military forces are organized as highly structured institutions. Officers and enlisted personnel must be trained to place themselves in harm's way, and to use deadly force when necessary. A dilemma exists in that the same youth in civilian life, who are exhorted to show respect for the rights of others and to exercise prudence for their own safety, are taught in the military that under certain circumstances they must kill and face appalling dangers. The necessity of recruiting youth for military deployment does not obviate the importance of understanding the potential psychological problems to which service exposes them.

Generally speaking, in the history of the U.S., a sense of moral purpose pervaded the nation's involvement in war, and this provided a large measure of social and psychological protection for members of the military. An implicit contract existing between the nation and our armed forces, acknowledges that the nation owes its safety to their terrible sacrifice, and is therefore ready to show respect and gratitude for its returning warriors. Anything that undermines belief in this covenant can cause serious problems with morale and the ability of the troops to cope with the trauma of combat.

The importance of reintegrating veterans back into society after they have completed their combat service plays a crucial role in reestablishing a healthy pattern of emotional development (Morrier, 1984). Silver's (1994) description of the methods employed by some native american tribes to respond to their returning Vietnam veterans underscores this process. In many native american tribes, war is perceived as a disruption of the natural order that threatens to bring down the world into chaos. One hazard of the conflict-ridden role warriors must assume is their vulnerability to great spiritual dangers as a result of participation in combat. Warriors therefore were expected to participate in protective and healing rituals after battle. These rituals served as protection against the "sanctuary trauma," that silver defined as the hostile, unsupportive, or indifferent response that the warrior or trauma victim receives when returning to a sanctuary environment such as emergency room, police station, country, family, tribe.

It is well established that the adverse psychological effects of combat expose members of our military to significant risks of posttraumatic stress disorder (PTSD) and other stress related psychiatric conditions. Kulka, Schlenger, Fairbank et al. (1990) estimated that 1.7 million male and female veterans of the Vietnam war suffered from partial or complete symptoms of PTSD at some point in their lives. Stress related disorders can have quite serious and lasting effects that ripple throughout the rest of society. Many who faced combat and its sequelae during wartime and subsequently developed PTSD, have suffered continuing and chronic disease lasting for many decades (van der Kolk, 1987; Macleod, 1991; Hovens, Falger, Op den Velde et al., 1994). Moreover, studies of World War II veterans and their children have demonstrated the potential for chronic PTSD to exert a significant psychological impact on succeeding generations (Rosenheck, 1986).

In this chapter, various aspects of the psychiatric sequelae of stress confronting women in the military will be reviewed, including a historical, anthropological, and cross-cultural perspective, a review of prevalence studies of PTSD and comorbid conditions as they relate to the population at large and to military women in particular, a review of gender factors that may affect psychological, social and biological responses to stress, and a summary of gender research that is relevant to an understanding of the inner meanings and social supports that play such an important role in human response to stress. A final section will attempt to integrate this review, with a special emphasis on suggestions for future research and study.

Historical, Anthropological, and Cross-Cultural Perspectives

Shame, demoralization, and loss of belief in a coherent world, play an important role in the onset and quality of PTSD symptoms following trauma (Ullman & Brothers, 1988). For this reason, it is important to review some of the historical and cultural factors that have operated to impact women's vulnerability and resilience to wartime trauma.

Exclusion of women from full participation in military roles appears to have developed along with the general disempowerment of women in other spheres of life, a factor that probably has long been detrimental for women's mental health. Wenegrat (1995) argued that the increased risk women face for many psychiatric disorders such as depression, anxiety, conversion symptoms, dissociative disorders, and eating disorders, are primarily a result of their exclusion from power in critical societal functions. Similarly, Zerbe (1995) reviewed research indicating that women are three times more likely to suffer from anxiety disorders than men, attributing this in part, to their greater risk for childhood sexual abuse and to gender-role expectations. It is important to consider that if such factors explain the increased risk among women to develop stress syndromes, increasing inclusion of women in military and other nontraditional roles may serve to enhance their resiliency and ability to cope with stress. In other words, the more women are empowered through training, positions of responsibility, and the sense of inner worth that comes from mastering difficult life experiences, the less likely they are to have their emotional world shattered by severe adversity.

Wenegrat (1995) reviewed historical evidence from 3000 B.C. to the biblical era, showing how women in ancient mesopotamia were gradually removed from their relatively elevated social status to a point where they became little more than chattel to be conquered in war and protected as the property of the men who owned them.

The subjugation and exclusion of women from positions of power varied through history and culture. In societies where women had direct access to the production of food and other resources, they were less likely to be subjugated. For example, in west africa, where the hoe was the main agricultural implement, women, who were equally able to wield a hoe, retained more power than women in northern India, where conditions required use of the plow (Wenegrat, 1995, pp. 124, 133).

Herodotus wrote of the warrior women of the Sauromatae in ancient Scythia, who were said to be descendants of the legendary amazons. A group of amazon prisoners were reported to have overpowered their greek captors while being transported by ship after having been defeated in battle. They landed in scythia where they intermarried with a band of Scythian men, forming the sauromatae tribe. According to herodotus, the sauromatae had a law that forbade a woman from marrying until she had killed an enemy in battle.

In an effort to understand why women tend to be excluded from the warrior role, Adams (1983) employed a cross-cultural study of 67 "stateless" cultures, to determine what factors distinguished whether women were allowed to participate in warfare. He found that in 9 of the 67 cultures, women historically played an active role as warriors in combat (e.g. the Comanche, Crow, Navaho, Maori). These cultures were all characterized by a pattern

in which marriages were contracted exclusively within the local community, and warfare was confined to groups outside of the communities from which the men selected wives. In the cultures in which women were excluded from warfare, he found they were forbidden to possess or fabricate weapons for the purpose of hunting or fishing, and from participating in war councils. Adams hypothesized that the exclusion of women from combat in these societies was unrelated to their lack of innate aggressive abilities, but rather developed to prevent women from joining in battle on the side of their fathers and brothers against their husbands.

Hallet (1970) reviewed the history of dahomey's unique political system in the early 1800's. The Dahomian Army was estimated to be composed of 7000 men and 5000 women, and in the 19th century, was reputed to be the most organized and efficient in west africa. The corps of female warriors (Amazones) constituted a completely trustworthy royal bodyguard for the kings (see also Depuy & Depuy, 1977). Other women in the royal government were assigned to serve as intermediaries to monitor government officials chosen only from clans of commoners. This custom appears to have evolved as a way of stabilizing the ruler's power by preventing other members of the royal family from participation in political power, or obtaining geographical access to the king's palace, and served to protect against the pattern of intrafamilial regicide so prevalent in neighboring states during that period.

Dugaw (1989) reviewed the motif of the female warrior that appeared in many ballads during the 17th-19th centuries as reflecting numerous instances of women, particularly of the lower classes in england and france, serving on warships and in the infantry. Women's military service most often entailed use of masculine disguise. These ballads demonstrated an awareness among songwriters of that period of actual events. Other authors report similar examples involving american women (Holm, 1982; Smith, 1981). The ballads themselves romanticized the overturning of the gender role differentiation. As reflected in recurring ballad themes, by disguising herself as a man and joining up to accompany her boyfriend who had gone off to war, the heroine proved that instead of being a stay-at-home lover, she too could show courage and valor, and even more--a resolute willingness to challenge the authority of her father and social custom. Typically these ballads ended with everything put right again in the traditional sense. At a critical point after combat, the women warrior would typically reveal her true identity and marry the lover whom she so loyally followed into battle.

A complex interplay of cultural, psychological and even religious factors appear to play a deciding role determining whether a community will allow women to engage in combat. For example, women soldiers initially played important combat roles during Israel's 1947-1949 war for independence (Lorch, 1961; Saywell, 1991). They were later excluded from direct combat activity when the situation became less desperate. Concerns about the morality of women fighting together with men, and religious pressures appeared to play a role in this decision (Saywell, 1991).

Smith (1981) reviewed the role of union Army combat nurses during the american Civil War. Overall, 9000 women were estimated to have served in the union during this bloody conflict. Smith cited the work of Florence Nightingale who demonstrated that good

nursing care reduced mortality among British soldiers wounded in the 1856 Crimean War from 60% to 1%. Nightingale helped to establish nursing as a professional discipline. She attributed reduction in mortality to the results of "talent, training, and organization," and to a "toughminded insistence on observation, ingenuity and perseverance." In contrast, at that time nursing care was attributed in the popular mind to the specific feminine and maternal qualities of nurses.

According to Smith (1981), one of the chief accomplishments of the women who served as nurses in the union Army was that they established that women could work on a par with men in a vital war effort to save the nation. Nevertheless, the prominent role played by military nurses in the Civil War encountered considerable opposition. Surgeons did not treat them with courtesy, and objected to their presence as a challenge to their authority. In contrast, the primarily middle class women who served as union Army nurses were convinced of their moral and practical superiority over men, whom they believed to be obstructionists who were mainly good at producing red tape. In their domestic lives, these women had been relegated to rule over the home, but were excluded from parity in the world of government and commerce. The great majority were not feminists as we understand the term today, and did not seek to change the social order. They did believe however, that women were the guardians of the moral aristocracy in america. To the task of caring for the wounded, they brought a moral sensibility based on cleanliness, patience, order, and a belief in healing. This was something they felt they could do better than men. Far from challenging the authority of men, they saw the war as an opportunity for them to participate in the nation's tribulations. Women's moral citizenship empowered them to help to contribute to a moral image of the union Army as a force for freedom and righteousness--a citizen Army that was prepared to die for its country's integrity and ideals.

Many Civil War nurses feared that exposure to the temptations of camp life was a threat to the nation's morals. They saw themselves as surrogate mothers and sisters, as a moral influence that would preserve the Army's soul, while the men saved its body (Smith, 1981). To a significant degree, the idealization of their mission, and the sense of being empowered as full citizens participating in the nation's hour of need, undoubtedly protected these women from much of the trauma of the terrible carnage they were forced to witness. Quoting nurse Jane Woolsey (Smith, 1981):

"It seems as if we were never alive till now; never had a country till now."

Smith (1981) emphasized that the female nurses gave a different meaning to their work than the men who worked with them. Although publicly praised for their self-sacrificing, unassuming passivity, patience, modesty and forbearance, in reality they were often forceful go-getters who were excellent at cutting through red tape in emergencies. For example, Clara Barton was able to get her hospital supplies to the battle of Antietam before it began. Because of her tremendous organizational ability, indomitable determination, and nerve, Mary Ann ("Mother") Bickerdyke, was selected by General Sherman to accompany his Army to set up field hospitals.

Living as they did in the Victorian age, Civil War nurses learned to transcend the deeply entrenched gender roles that were so rigidly defined between men and women of that time, by forming a camaraderie with the soldiers--it was an alliance born of trust and understanding that served to work against bureaucracy and authoritarian assumption of roles.

Smith (1981) gathered data from letters and memoirs showing how men during the Civil War era tended to experience the war along different dimensions than women. Men saw it as courageous endurance, discipline, camaraderie, self-control, longing for glory, and the ability to turn circumstances to positive advantage. Judging from their writings and their efforts to find meaning, women nurses were better able to acknowledge on an emotional level the carnage they witnessed. According to Smith (1981), despite the rigors and horrors of caring for the wounded, one nurse, Cornelia Hancock felt better than she ever had in her life:

"Cornelia was, in fact, enjoying the freedom and independence the war brought to nurses, or at least to the strong ones. They bloomed because they were needed, because they had the right to work at what suited them, and the right to be strong, rather than dependent and passive, in the service of their country."

Smith's (1981) report of Nurse Hancock supports Wenegrat's (1995) thesis that disempowerment correlates with symptomatology. Whereas Ms. Hancock had suffered from frequent attacks of dyspepsia prior to the Civil War, these symptoms disappeared during her wartime service.

World War I saw a similar deployment of women as military nurses. The First Aid Nursing Yeomanry (FANY) was organized as an independent voluntary corps of women in 1907 by the British (Minney, 1956), as an adjunct to the ambulance corps. In World War I, women rode horseback to the front combat positions to retrieve wounded to ambulance stations.

Holm (1982) emphasized how the acceptance of women in the military has been subject to enormous resistance--a resistance that often has been set aside during wartime crises. As an example, Holm (1982) cited the legendary Molly Pitcher who dodged a cannon ball as she took over her fallen husband's artillery position at the battle of Monmouth, New Jersey during the American Revolution. Typically, following resolution of the crisis, societal opposition to women in the military or in the workplace has been reestablished. A similar pattern was seen in the U.S. following World War II, when women who served as industrial workers in the war effort were expected to relinquish their jobs (Houtchens & Henry, 1995).

A defensive use of pride and shame probably plays an important function in the historic exclusion of women from military service. In the debate surrounding the formation of the Women's Auxiliary Army Corps (WAAC) in 1942 conducted in the U.S. House of Representatives, one congressman sarcastically remarked (Holm, 1982, p. 24):

"I think its a reflection upon the courageous manhood of the country to pass a law inviting women to join the armed forces in order to win a battle. Take the women into the armed service, who then will do the cooking, the washing, the mending the humble homey tasks to which every woman has devoted herself? Think of the humiliation! What has become of the manhood of America?"

During World War II, American GIs were responsible for slanderous sexual jokes and ridicule directed towards WAACs. Holm (1982, p. 52) attributed this to a wish to drive woman out of the "man's world." This has become more difficult as women have become more resistant to being placed in a subordinate role. The difficulty in recruiting women into the military during World War II was expressed by one recruit in 1944 (Holm, 1982):

"The trouble lies with the U.S. men. The average serviceman absolutely forbids his wife, sweetheart or sister to join a military organization . . ."

Nevertheless, many women played active combat roles during World War II, particularly in european resistance forces (Hovens, Falger, Op den Velde et al., 1994; Minney, 1956; Rossiter, 1986, Jancar, 1991). According to Rossiter (1986), Selwyn Jepson of the British Special Operations Executive (SUE) considered women well adapted to deal with the special dangers involved in missions supporting the french resistance because he believed that they possessed "lonely courage"--the ability to act intrepidly without the presences of comrades to support their actions as men did. For example, Violette Szabo was recruited into the British forces and served as an undercover agent with the french maquis (Minney, 1956). She possessed a strong presence of authority along with the ability to lead and command respect among men. She was very athletic, was quite resistant to hardship and pain, and was able to stand up to bullies as a child. After her husband was killed in combat, she left her infant daughter with her family to join the British forces. She was trained for hand-to-hand combat, use of automatic weapons and explosives, and given role-play training to deal with possible imprisonment and interrogation. On her second mission to france while with the french resistance, she was captured and later murdered by the nazis. She never revealed information despite repeated torture. She was awarded the George Cross and Croix de Guerre posthumously.

During the Vietnam war, most women in the combat zone functioned as military nurses (Holm, 1982; Brende & Parson, 1985; McVicker, 1985; Sandecki, 1987; Norman, 1988). Many of those female nurses endured repeated exposure to grotesque injuries and death while treating casualties. Through their triage role these nurses were burdened with decisions of life and death. They were on average older than the troops for whom they cared. As officers, they were off limits for romantic involvement with enlisted men. Case studies show how these factors related to Vietnam nurses' beliefs about their gender based roles--factors that shaped their subsequent posttraumatic symptomatology.

Female veterans of Vietnam faced special problems that led to an increased sense of isolation and "sanctuary trauma" (Silver, 1994) upon their return home. Norman (1988) conducted extensive in-depth and structured interviews of 50 female military nurses who served in Vietnam from 1965-73. Quotations from the respondents in her study reveal the difficulty of "detoxifying" the war-time trauma as opposed to other types of trauma experienced in civilian life. For example, one of the nurses she interviewed reported (Norman, 1988):

"I've had surgeries and lost a baby since the war. Both affected my life very much. Obviously losing the baby was the most traumatic, but I can grieve for the baby and feel better. I've never been able to grieve about the war so Vietnam still hurts."

Many Vietnam veteran nurses experience feeling survivor guilt, helplessness, and the trauma of having to make life and death decisions, one nurse reported (Norman, 1988):

"I remember, looking at this 19-year old triple amputee and wondering if I was right to save him. I mean, what kind of life was this boy going to have?"

Sandecki (1987) reported the case history of a female veteran who was not a nurse, but whose military assignment in Vietnam involved administrative work monitoring troop movements and processing casualty reports:

At age 20, she had volunteered for the armed forces out of a sense of patriotism, a desire to do something really important, a belief that war veterans commanded respect, and because she had been raised to believe that freedom requires responsibilities and obligations.

When she got to Vietnam she learned that there were no safe zones. Her first exposure to casualties "nearly gagged me." She was told not to react but to learn to control her emotions if she were going to make it. She began to drink heavily to achieve this end. She returned home from Vietnam with a sense of pride and accomplishment for having done her job under tremendous duress, but found that she was shamed and criticized for her participation in the war:

"But there were no congratulations or pats on the back. Instead, there were insults, anger, isolation, and crazy accusations. My high school chums were now in colleges and universities either actively or quietly protesting against the war I had just returned from. And, they protested me--by arguing with me, rejecting my reasoning, discounting my experience, and finding me deserving of all the horrors I had endured for having been 'stupid enough' to volunteer."

McVicker (1985) reviewed some of the problems affecting female nurses during their assignment in Vietnam. These included inadequate prior training for nurses dealing with combat trauma and psychological casualties, the absence of a sense of safety,

restriction of movement, being guarded when off duty for protection against male servicemen, being called an "MPP" ("military paid prostitute") upon return from Vietnam (see also Sandeck, 1987; Livingston & Rankin, 1986; Thomas & Thomas, 1993; Holm, 1982), feeling less entitled to have psychological difficulties such as PTSD because they thought they had it easier than the combat infantrymen, feeling rejected by veterans groups, feeling unwelcome at va treatment centers, and being distressed by memories of sexual harassment during their military service by exposure to the "macho" climate in the veterans center.

Similarly, Holm (1982, p. 241) emphasized how societal shaming for returning female Vietnam veterans differed from the shaming of the male veterans. Men were taunted by some as being "fools" or "suckers" for fighting in the war. Women suffered a greater insult because everyone knew they were not subject to the draft and therefore were volunteers. Women were sometimes accused of having gone to Vietnam for sexually immoral reasons--to service the troops.

McVicker (1985) summarized some characteristic reactions of Vietnam nurses when they did seek treatment for psychological problems that included depression attributable to feelings of hopelessness and helplessness while caring for massively traumatized servicemen, distress when encountering men who survived catastrophic injuries because they harbored unrealistic beliefs about their responsibility for the recovery of the men they treated in the war, alienation from their parents, "shutting down" their feelings in Vietnam and continuing to use this protective mechanism upon their return home, fear of having children because of witnessing the results of atrocities or fear of possible exposure to unknown teratogenic chemicals, and emotional fear of romantic relationships.

Many nurses become romantically involved with married officers, sometimes unknowingly on their part. As supportive as these relationships might have been, the women often suffered considerable emotional trauma when the senior male officer returned home to his family. In one example described by McVicker (1985), a nurse did not find out that the man with whom she had become involved was married, until he was admitted to her ward. She discovered that his wife was his next-of-kin.

There is evidence that gender bias and sexual harassment contribute to stress experienced by women in the military. According to Schwartz (1994), 50% of women patients in a veterans administration psychiatric hospital reported instances of sexual harassment by male patients, and that in a "sub-assertive" fashion, they rarely made any complaints about it. Schwartz interpreted this as characteristic of the "learned helplessness" of the caste system in the rank structure of the military. Furey (1994) pointed out that for many years it was quite difficult for female veterans to receive gender-specific care within the va system such as sexual trauma counseling, pap smears and mammography.

Exclusion from full participation because of gender rather than ability has long served as a stressor for military women. A gradual change in attitude has allowed many individuals to participate and excel in ways that were previously closed to them. This change has coincided with a greater understanding of how social attitudes rather than actual ability affected acceptance of women into military organizations.

In their study evaluation of women in the Army (EWITA) prepared for the Department of the Army, Roberts, Baker, Caldwell et al. (1978), concluded that sex-related differences in coordination, confidence, ability to engage in teamwork, and mechanical ability had no apparent bearing when it came to women's capacity to function as soldiers. They emphasized that closing officer speciality assignments to women because of the physical demands of a job made sense only on a probabilistic basis (i.e. most women might not be physically qualified), but that it unfairly excluded many individual women who would be fully capable. They recommended that such jobs be filled on an individual evaluation of physical fitness without regard to gender.

The EWITA study surveyed 7384 soldiers in the selected officer specialties (military occupational specialty, MOS) and 993 in service academies regarding their attitudes toward integrating women into the Army. Selected responses to questions about whether women soldiers would have more problems than men in wartime situations included the following:

- 55.9%: women soldiers not being tough enough (i.e. ability to handle criticism or threats)
- 54.5% women being too emotional
- 52.1% women unable to deal with stress [57% of men and 37% of women surveyed]
- 47.0% women not aggressive enough
- 48.8% women would have problems not feeling feminine enough on the job [i.e., would have problems with self-image]

Two respondents made the following specific comments to the survey:

"Physically, a 98 lb. woman can fight a war as well as a 98 lb. V.C. (Viet Cong)."

"There is no reason save cultural tradition why women cannot perform any task men can. I cannot lift as much weight as an olympic weight lifter, but I can handle myself and jump from airplanes. Women can too. If present day women do not seem as physically capable as men it is solely due to the culturally prescribed child upbringing. In fact physically, mentally and emotionally they have the capability and potential to perform well even as infantry in combat."

The EWITA study concluded there was insufficient evidence to make a definitive statement about biophysiological differences between men and women in their ability to adapt to environmental stressors such as extreme temperatures or altitude. Many of the problems of integrating women into the Army at that time appeared related to problems in

perceptions about their ability to lead. It was felt that such bias could be attributed to sex role stereotypes, i.e., men are traditionally valued for competence, objectivity, business skill, and decision making, whereas women tend to be valued for warmth and expressiveness.

Allowing women increasing opportunities to participate in the military has shown that previous cultural assumptions related to gender were based more on self-fulfilling prophecies rather than on innate ability or resilience. These same biases can affect interpretation the effect of gender on PTSD. As I will review in the following sections, gender effects suggesting that women are more vulnerable to stress tend to disappear when the population samples include men and women in job assignments with equal authority and responsibility.

Prevalence of PTSD in Civilian and Military Populations

In this section, studies that provide estimates of the prevalence of PTSD in civilian and military populations are reviewed, with particular emphasis on the differential rates found between males and females. Table 1 reviews some of the studies comparing prevalence of PTSD in males and females within the same population sample. Table 2 summarizes other stress-related clinical outcomes in males and females.

Although PTSD is not the only psychiatric disorder resulting from exposure to stress, it has received the most systematic study. PTSD serves as a model for much of the clinical research on the interaction between disturbing life events, subjective experience, and biologic vulnerability. Other stress-related conditions such as depression, generalized anxiety disorder, substance abuse, and other anxiety conditions, will be discussed in more detail in a subsequent section.

Estimates of the prevalence of PTSD are not entirely consistent across studies. This is not surprising however, given the variability of the populations studied, problems with the use of different instruments, the variability in type or degree of traumatic exposure, and problems with comparing populations of males and females without controlling for occupational status and social role. Many of these problems have been discussed in recent literature (Kulka, Schlenger, Fairbank et al., 1988; Wolfe, Brown, Furey et al., 1993; Keane, Weathers, & Kaloupek, 1992; Resnick, Kilpatrick, Dansky et al., 1993; Lurie, Bar-Tal, & Glick, 1995). In the studies cited below, it is important to distinguish between current and lifetime prevalence estimates, the latter reflecting diagnosis of PTSD at any previous time in the individual's life.

Civilian populations. Considering the gender-related effect on vulnerability to psychiatric disorders in general, populations studies show that women have higher current and lifetime prevalence of anxiety and affective disorders (Wenegrat, 1995; Zerbe, 1995; Kessler, McGonagle, Shao et al., 1994). For example, in a national sample of 8098 respondents interviewed with the diagnostic interview schedule for DSM-III-R diagnoses (DIS), Kessler, McGonagle, Shao et al. (1994) found that current prevalences for any anxiety disorder among women was 14.1% and 8.5% for men.

Table 1*The Prevalence of PTSD: Studies Bearing on Sex Differences*

Study	Sample	Males <i>n</i>	% PTSD	Females <i>n</i>	% PTSD
Helzer et al., 1987	Household sample (St. Louis, MO) lifetime prevalence	965	.5	1528	1.3
Shore et al., 1989	Rural NW community sample lifetime PTSD	515	2.9	510	3.3
Breslau et al., 1991	Large HMO, Detroit, MI lifetime prevalence	386	6.0	621	11.3
	lifetime prevalence, given exposure to trauma chronic PTSD (3-year duration)	166	14.0 1.3	228	30.7 4.7
Wolfe, Brown, & Kelly (1993)	Returning soldiers Operation Desert Storm current prevalence	2136	3.9	208	9.1
Kulka et al., 1990 (NVVRS)	Vietnam veterans current prevalence lifetime prevalence	1612	15.2 30.9	736	8.5 26.9
Hovens et al., 1994	World War II Dutch Resistance fighters current prevalence	680	27.4	144	20.1

Table 2*Sex Differences in Stress-Related Clinical Outcomes Other Than PTSD*

Study	Measure	Males	Females
Kulka et al., 1988, 1990	Lifetime risk of full or partial PTSD in Vietnam veterans	53.4%	48.1%
	Difference in PTSD prevalence attributable to predisposition	25.7%	-0.5%
	Risk of violent behavior compared to same-sex non-Vietnam veterans	higher	same
Breslau et al., 1991	Risk of exposure to trauma	OR=1.5	OR=1.0
	Risk for chronic PTSD	OR=1.0	OR=2.8
	Risk for nonchronic PTSD	females = males	
Feinstein & Dolan, 1991	Risk of PTSD from orthopedic injury	females = males	
Roca et al., 1992	Risk of PTSD following burns	females = males	
Perconte et al., 1993a	PTSD and stress scores, combat Desert Storm deployed reservists	females > males	
Mayou et al., 1993	Risk of acute stress disorder following traffic accident	females = males	
Southwick et al., 1993	PTSD check-list scores Desert Storm deployed reservists	females = males	

Table 2, continued

Wolfe, Brown, & Kelly, 1993	Symptoms in Desert Storm soldiers including nightmares, avoidant thoughts, irritability, exaggerated startle	females > males
Ross & Wonders, 1993	PTSD scores Desert Storm reservists	females = males
Vrana & Lauterbach, 1994	Exposure to trauma events	OR=3.0 OR=1.0
	Exposure to rape	females > males
	Abusive relationship	females > males
	Perceived sexual assault as most traumatic of their life	females > males
	State Anxiety if sexually abused as child	males > females
	Depressive score if unable to talk about most traumatic event	males > females

Using the DIS, Helzer studied 2493 household residents in the city of St. Louis, MO by means of a stratified area sampling. Although serious problems exist with epidemiological studies conducted with the DIS because of its unacceptably low sensitivity to the diagnosis of PTSD (Kulka et al., 1988), this study is of interest because it is the first large scale effort using the DSM-III criteria for PTSD. Helzer, Robins, & McEvoy (1987) found a lifetime prevalence of 0.5% PTSD in women, and 1.3% in men. PTSD was found in 20% of individuals wounded in combat. No women were found who served in combat. Partial symptoms of PTSD were found in 15% of men and 16% of women.

Using the DIS, Shore, Vollmer, & Tatum (1989) conducted a community-based study on two rural logging populations in the northwest (total $n=1025$), only one of which was affected by the Mount St. Helens volcanic eruption. They divided the disaster affected community into low exposure ($n=410$) and high exposure groups ($n=138$). A total of 12 cases of PTSD could be attributed to the volcanic disaster, and 27 cases of PTSD were attributed to other causes. Ten (83%) of the disaster cases were women. They found an overall lifetime prevalence of PTSD from all causes in both communities to be 2.9% in men, and 3.3% in women. Combining disaster-related PTSD with co-morbid rates of generalized anxiety disorder and depression, they found a one-year incidence of stress related psychological disorder to be 11.1% for men, and 20.9% for women.

Breslau, Davis, Andreski et al. (1991) studied a random sample of 1007 young adults enrolled in a large urban hmo using the DIS. Traumatic events were frequently endorsed by the respondents in the sample, and included items such as experiencing a sudden injury or accident, physical assault, seeing someone seriously injured or killed, threat to one's life, rape, and involvement in a disaster. Traumatic exposure was experienced by 39.1% of the population (43.0% of men and 36.7% of women). Although men in this study were significantly more likely to have been exposed to traumatic events, odds ratio (or)=1.5), women were significantly more likely to develop PTSD (OR=1.8) once exposed. Actual lifetime prevalences of PTSD was 6.0% for all men, 14.0% for men exposed to trauma; 11.3% for all women, and 30.7% for women exposed to trauma. The rate of PTSD did not vary much across different types of traumatic events except that women who had been raped (80%) had a higher rate of PTSD than any other group. Other factors besides gender that predicted increased risk for PTSD in this study, were early separation (OR=3.5); family history of anxiety (OR=2.9); pre-existing anxiety/depression (OR=2.5); family history of antisocial behavior (OR=2.0); and neuroticism as measured by the Eysenck scale (OR=1.5).

In a subsequent analysis of the same data to determine factors predicting chronic PTSD, Breslau & Davis (1992) found that 57% of the 93 respondents meeting DSM-III-R criteria for PTSD reported symptoms that lasted for one year or more (their definition of chronic PTSD). Women comprised 83% of those diagnosed with chronic PTSD. Controlling for effects of multiple variables predicting chronic PTSD, they found that sex was one of the significant risk factors (or = 2.83). Non-chronic PTSD in their population was unrelated to female sex. Comparison of the chronic PTSD group with the nonchronic PTSD group showed the chronic individuals to be significantly more likely to suffer symptoms such as psychogenic and physiological reactivity to symbolic reminders of the trauma, detachment from others, having no loving or warm feelings, problems with concentration, co-morbidity with any affective or anxiety disorder, and more self-reported medical conditions such as arthritis, bronchitis, migraine and gynecologic complaints among women. The higher co-morbidity with any anxiety or affective disorder in their chronic PTSD group was independent of female sex or family history of antisocial behavior.

As previously noted, there is a high risk of PTSD following rape trauma. Resnick & Kilpatrick (1994) reviewed results of the prospective National Women's Study, and found the lifetime prevalence of PTSD to be 12.7% for women who had been raped. Rape was defined as the presence or threat of physical force combined with unwanted oral, vaginal, or anal penetration. From these figures they estimated that approximately 12 million american women have experienced a completed rape sometime in their lifetime. They emphasized that divergent figures across different studies may be related to the different ways of defining a completed rape and measurement instruments employed. They also emphasized that previous exposure to crime is a risk factor for subsequent victimization.

Analyzing other results from the previously cited prospective study, Kilpatrick, Resnick, Saunders et al (in press) found that of 3359 women from a representative national sample studied over a 4-year period, 156 (4.3%) had been victims of a new rape or

aggravated assault during the period of assessment. Overall 6-month prevalence of PTSD for the sample was 5.1%. Logistic regression showed that predictors of a new rape during the assessment period included a prior history of assault and an income below \$10,000. Significant predictors of PTSD at follow-up assessment included prior victimization, a new assault during the assessment period, and high sensation-seeking. In another publication (Resnick, Kilpatrick, Dansky et al., 1993), the authors reported that the overall sample lifetime prevalence of PTSD from any cause was 12.3%. Lifetime prevalence of PTSD for women who were raped was 32.0%. Lifetime PTSD prevalence for all causes was higher among crime victims than non-crime victims (25.8% versus 9.4%).

Kilpatrick, Saunders Amick-McMullan et al. (1989) studied 391 female residents of Charleston, SC of whom 294 were crime victims assessed for crime related PTSD (CR-PTSD). Regression analysis showed that time since injury, life threat, physical injury, and completed rape, each made an independent contribution to explaining CR-PTSD. By controlling for the effects of time since violence, and degree of danger to the victim, they showed that rape itself contributed to 10% of the variance in predicting CR-PTSD. Overall, 57.1% of respondents who reported completed rape developed PTSD. When life threat and injury was combined with completed rape, the percentage developing PTSD was 78.6%.

Vrana & Lauterbach (1994) studied a nonclinical sample of 440 undergraduates (males = 234; females = 206), employing a traumatic events questionnaire based on Criteria A (i.e., defining whether the individual was exposed to serious mental trauma) for DSM-III-R PTSD, and psychological measures that included the Impact of Events Scale (IES) (Horowitz, Wilner, & Alvarez, 1979), the Mississippi Scale for Combat-Related PTSD (M-PTSD) (Keane, Caddell & Taylor, 1988), the State-Trait Anxiety Inventory Trait version (STAI-T), and the Beck Depression Inventory (BDI). On average, males experienced a significantly greater number of traumatic events (2.98 versus 2.52). Males were significantly more likely to be in an accident, in a life-threatening situation, in a fire, to witness a death, or to be in combat. Females were more likely to have been raped or in an abusive relationship as an adult. Significantly more females than males who had been sexually assaulted perceived this event as the most traumatic one of their life (53% versus 11%). Partitioning the variance predicting IES scores showed that 15% of the variance was predicted by the total number of traumatic events respondents had experienced, with females showing a more positive association between number of traumatic events and IES scores. Females who witnessed a violent death had significantly higher Mississippi PTSD (M-PTSD) scores than males with the same traumatic experience. Males who were abused as children showed significantly higher anxiety scores on the STAI-T than females who were abused. When the most traumatic event of the respondent's life was something that he or she was unable to talk about, males evidenced significantly more depressive symptomatology than females.

One of the problems with population studies attempting to measure the effects of trauma results from the difficulty of controlling for the nature and intensity of the distressing event. The prospective study of groups exposed to the same type of trauma, with measurements of stress beginning soon after the traumatic event, holds promise in distinguishing the influence of gender and other factors on the development of PTSD. Studies of this type include military personnel and civilians in war-zones (see next section),

victims of community disasters, and victims of physical accidents or burns (Landsman, Baum, Arnkoff et al., 1990; Feinstein & Dolan, 1991; Southwick, Morgan Nagy et al., 1993; Roca, Spence, & Munster, 1992; Mayou, Bryant, & Duthie, 1993; Epstein, 1994).

Feinstein and Dolan (1991) studied 34 men and 14 women patients admitted to an orthopedic ward for surgical treatment of fractures. They assessed their psychological status at 6 weeks and 6 months by means of a DSM-III-R self-reported symptom check-list for PTSD, the IES, the Clinical Interview Schedule (CIS), and the General Health Questionnaire (GHQ) (28-item version). Patients were also assessed regarding the objective and perceived seriousness of their physical injuries. Twelve patients were found to have PTSD at 6 weeks (25%). By 6 months this number had decreased to 7 patients (15%). Discriminant analysis did not show gender to be a predictive factor, although women had significantly higher IES scores. Initial IES scores and weekly alcohol consumption were predictive of developing PTSD. They found no relationship between objective or subjective perception of the severity of the accident and the onset of PTSD.

Mayou, Bryant, and Duthie (1993) conducted a prospective study of 188 (128 males and 60 females) consecutively admitted road accident patients, and assessed them at soon after the accident, and at 3 and 12 months. the authors found three types of stress response syndromes suffered by patients in their sample at some time during the 12 month study, including 18% with an acute stress disorder, 10% with depression and/or anxiety as measured at the present status examination, 11% with PTSD at some point during the 12 month follow-up, and approximately 10% with persistent travel anxiety. There was considerable overlap between the three syndromes. Approximately 25% of the patients suffered psychiatric symptoms at 12 months. Acute stress reaction was not significantly related to sex, age, type of accident, or assessment of blame for the accident, but was positively related to Eysenck Neuroticism scores. Of those who suffered acute stress reaction at baseline, 2.9% had no symptoms at one-year follow-up, 7.6% had mood/anxiety disorder, 7.6% suffered travel anxiety, and 5.2% PTSD. Patients with diagnoses of depression/anxiety, PTSD, or travel anxiety suffered significantly more impairments in measures of problems with finances, social life, work, and leisure. Although all of the persisting stress syndromes overlapped considerably, depression/anxiety patients evidenced more prior emotional problems than those with PTSD. PTSD and travel anxiety were strongly predicted by initial "horrific" and intrusive memories of the accident. Compensation prospects for the accident played no role in any of psychiatric disorders.

Roca, Spence, and Munster (1992), studied 35 men and 8 women admitted to a regional burn center and administered the schedule for clinical interview DSM-III (SCID) (Spitzer, Williams, Gibbon et al., 1990) on discharge and 4 months after discharge. PTSD was diagnosed in 3 of 43 (7.0%) patients at discharge, and in 7 of 31 patients (22.6%) who were administered the scid at 4 month follow-up. The likelihood of reporting PTSD was not significantly related to gender, age, or severity of burns.

Military populations. The Centers for Disease Control (CDC) Vietnam Experience Study (VES) (1988) studied a random subsample of enlisted male U.S. Army veterans who had served during the time of the Vietnam war (1965-71). The study group

consisted of 2490 Vietnam veterans ("theater" veterans) and 1972 veterans who served outside of Vietnam during the same time period ("era" veterans). Assessment instruments included the DIS and the Minnesota Multiphasic Personality Inventory (MMPI). Current prevalence of PTSD in Vietnam veterans was 2.2%, lifetime prevalence was 14.7%. Prevalence was not calculated for non-Vietnam veterans in this study.

The most comprehensive retrospective study ever conducted on a military population was the National Vietnam Veterans Readjustment Study (NVVRS) (Kulka, Schlenger, Fairbank et al. (1988, 1990). By use of a sophisticated sampling procedure, the NVVRS conducted 3016 interviews of Vietnam "theater" veterans (served in Vietnam proper), Vietnam "era" veterans (served during the time of the Vietnam war but outside of the theater of combat), and matched civilian controls. A sub-sample of 344 Vietnam theater veterans was also given face-to-face diagnostic clinical interviews with the SCID. Collateral interviews of a sub-sample of co-resident spouses or partners of 474 Vietnam theater veterans were also obtained. The SCID interview, the M-PTSD, and the Fairbank-Keane MMPI PTSD scale were the measures best distinguishing individuals with PTSD versus those without PTSD. Estimated prevalence of current PTSD was 15.2% in male theater veterans and 8.5% in female theater veterans. These figures varied by ethnic group. Corresponding rates for lifetime prevalence of PTSD were 30.9% in male theater veterans and 26.9% among female theater veterans. Approximately one-half of male theater veterans and one-third of female theater veterans who ever had PTSD still have current symptoms. Adding the prevalence figures for symptoms of partial PTSD among Vietnam theater veterans to those with full symptoms of the disorder, it was found that 53.4% of the men and 48.1% of the women had experienced clinical symptoms of a stress disorder. Male Vietnam theater veterans with high exposure to war-zone stressors had four times the level of current PTSD as male theater veterans with low or moderate exposure. Similar contrasts between levels of war-zone exposure among female veterans showed a seven-fold differential.

Kulka et al. (1988) also determined that overlapping, but somewhat different measures were necessary to compare the types of high stress situations that were relevant for female and male Vietnam veterans. For example, measures of exposure to combat, exposure to abusive violence and deprivation, discriminated high versus low stress for both men and women, whereas exposure to wounded and dead and exposure to enemy fire, were discriminating measures in women only.

In an effort to differentiate the effect of predispositional factors from combat-related factors on the etiology of PTSD, Kulka et al. (1990) adjusted PTSD prevalence by controlling for variables such as race, age, marital status, education, religious background, prior health status, prior family social environment, child abuse, childhood health, childhood behavior, and health problems among first-degree family members. This procedure showed a significant percentage decrease in PTSD among male Vietnam theater veterans. For example, the percentage difference in PTSD prevalence rates between male Vietnam theater veterans and male civilians was 14% before adjusting for predispositional variables, and 10.4% afterwards, suggesting that $(14 - 10.4)/14 = 25.7\%$ of the difference in prevalence rates among male veterans was due to predispositional factors, and that 74.3% was due to combat or post-combat factors. Using the same procedure for women,

they found much less evidence for change in PTSD prevalence rates by controlling for predispositional factors. Interestingly, adjusting for predisposition in the comparison between women Vietnam theater veterans and women Vietnam era veterans, it was found that the prevalence rate difference for PTSD between the two groups increased from 7.4% to 7.9%, suggesting that combined predispositional factors served a small (6.8%) protective function against developing PTSD in women, compared to predispositional factors operating as a negative risk factor in men. This finding is probably a result of the fact that female Vietnam theater veterans were predominately nurses, and constituted a much more homogeneous group that enjoyed higher educational, socioeconomic, and occupational status than males.

Problems of readjustment to civilian life following service in Vietnam were significantly greater in both males and females with high war-zone stress, PTSD, a history of substance abuse, or a service-connected physical disability. Both men and women with PTSD were less likely to be married, and more likely to have experienced marital and relationship problems than those without PTSD. Vietnam theater women, and those with high war-zone exposure in particular, were significantly less likely to exhibit violent behavior than Vietnam era women. In contrast, male Vietnam theater veterans with high war-zone exposure were more likely than their male era counterparts to have reported active hostility, violent behavior, arrests, and incarceration. Occupational instability was found two times more frequently in males with PTSD, and was four times as likely in females with PTSD. For female veterans entering service with a high school education, those exposed to high war-zone stress were more likely to have continued their education, and were better educated overall, even though they were also more likely to have reported a greater degree of instability in their work histories.

With regard to physical health problems both males and females with high war-zone exposure reported higher levels of physical health problems than did other groups. Women theater veterans with high war-zone exposure experienced a greater number of chronic physical disorders than both female theater veterans with low war-zone exposure and female civilians. Both male and female theater veterans with a current PTSD diagnosis or lifetime diagnosis of substance abuse experienced more chronic health problems and a lower perception of current physical health than theater veterans without these disorders.

Spouses or partners of Vietnam theater veterans reported more adjustment problems if the veteran had PTSD. Spouses or partners of women theater veterans with PTSD reported being much less happy or satisfied than those whose significant other was not diagnosed with PTSD.

In another study that attempted to distinguish the effects of pre-combat, combat and post-combat factors in Vietnam veterans conducted by Green, Grace, Lindy et al. (1990), 200 male Vietnam veterans were systematically recruited from both clinical and nonclinical sources. Respondents were interviewed with the Schedule of Affective Disorders and Schizophrenia-Lifetime Version (SAD-L) augmented by a PTSD module developed for their study, the IES, and other measures of pre-war and post-war social adjustments. Overall, the rate of PTSD diagnosis was 29%; in the no-treatment-seeking portion of the sample, the rate was 17%. Pre-military factors predicted 9% of the variance in diagnosis of

PTSD, military factors explained an additional 19%, and post-military an additional 12%. Premilitary factors appeared to have influenced PTSD diagnosis primarily by increasing an individual's exposure to more dangerous combat situations. Support at home-coming and current level of support (post-combat factors) diminished the likelihood of a diagnosis of PTSD. Support after the war also depended on a soldier's military experience, which in turn may have influenced his willingness to interact with others. Better educated soldiers reported more current social support after the war. Younger and less educated soldiers were more frequently exposed to severe combat experiences. Military factors also predicted other psychiatric diagnoses, but not to as great a degree as PTSD and panic disorder. Post-military factors explained 9% of the diagnosis of major depression and 4% each of drug and alcohol abuse.

European resistance organizations provided an opportunity to compare males and females who occupied roughly similar combat roles. Hovens, Falger, Op den Velde et al. (1994) surveyed 680 male and 144 female Dutch Resistance veterans of World War II. Respondents were assessed with a questionnaire mailed in 1985, 40 years after the end of the war, using a PTSD scale, the STAI, and the Zung Depression scale. They found a current prevalence of PTSD in 27.4% of the men and 20.1% of the women. In both men and women, PTSD scores were highly correlated with scores of depression and trait anxiety. No significant gender differences were observed between the measured variables. The authors cited evidence showing that in elderly populations of combat veterans such as those in the Dutch World War II resistance, overt symptoms of PTSD did not become apparent until several decades after the traumatic events, concomitant with aging and with a reduced effectiveness of previously successful coping strategies.

Perconte, Wilson, Pontius et al. (1993a) studied 521 male and 70 female reservists who were deployed in the Persian Gulf War. The various operations units to which they were assigned were exposed to varying levels of combat exposure. For example the Army 14th Quartermasters Unit's barracks was destroyed by a SCUD missile killing 13 members and wounding 37 others (Perconte et al., 1993b). Rating instruments included the M-PTSD, the Beck depression inventory, and the SCL-90R. Using the cut-off scores of the M-PTSD, they identified 15.5% of the combat deployed reservists to have PTSD, but only 3.9% of the non-deployed. Combat deployed females scored significantly higher than combat deployed males, however the magnitude of the difference was less than one half of the standard deviation. A similar difference was found on the measures of overall distress. Among the reservists of the most traumatized unit, the 14th quartermasters, women scored significantly higher on all stress measures, although this was based on a very small subsample (Perconte et al., 1993b). Neither race, nor prior combat service in Vietnam played a role in scores of any of the stress measures. There were no differences in self-reports of stress on these instruments between men and women deployed in non-combat units. The authors correctly emphasized that their findings provide no information as to whether these higher scores for combat-deployed women represented an adaptive or maladaptive response to combat trauma.

Stretch, Vail, and Maloney (1985), compared groups of Army nurses who had served in the Vietnam theater of war with nurses who had served during the same time period in other regions of the world. All nurses were still on active duty. Approximately

61% of the Vietnam theater sample was female. Employing a questionnaire to assess the presence of past or current PTSD symptomatology (the Vietnam-Era Nurses Adjustment Survey--VENAS), they determined that current PTSD prevalence among Vietnam theater nurses was 3.3%, but only 0.85% among Vietnam era nurses. Combining measures of past and present PTSD, they found a lifetime prevalence of 10.5% among the Vietnam theater nurses. The lower finding of 10.5% lifetime PTSD among active duty nurses compared with the corresponding figure of 26.9% among Vietnam veteran nurses (Kulka, Schlenger, Fairbank et al., 1988, 1990) may be a result of the protective social support of ongoing military service, and self-selection factors in cases where nurses with PTSD left service as a result of disabling psychiatric symptoms.

Kulka, Schlenger, Fairbank et al. (1988) reported the following disguised case vignette that underscores the possible protective effect of active duty:

B.R. was an air force veteran nurse who was in her late forties at the time of the NVVRS study. She served in Vietnam 1966-67, and cared for wounded soldiers. She experienced the death of several associates or friends with whom she was very attached, and occasional but unexpected exposure to shelling from enemy mortar fire. She felt that her service in Vietnam was the most exciting, but also the most traumatically damaging part of her military career. After return from Vietnam she suffered criticism and ostracism because of her service, but elected to continue in the military. For about 10-15 years, except for a continuing sense of social withdrawal, she suffered no psychological symptoms or impairment. After leaving the military, she developed overt symptoms of PTSD, and for the first time required treatment.

In a study that sheds light on reaction to witnessing grotesque injuries, Ursano et al. (1995) made a longitudinal assessment of PTSD in 54 mortuary workers handling dead bodies following the USS Iowa gun-turret explosion. One month after the event, 11% of the body handlers met the criteria for PTSD; none of the enlisted controls who were on site but who did not handle dead bodies met criteria for PTSD. The sample size was too small to study differential effects of trauma on men and women.

Sutka, Uddo, Brailey et al. (1994) provided further evidence for the high potential of exposure to grotesque experience of mass mortuary duty. They studied 21 male and 3 female Army reservists assigned to graves registration duty in Saudi Arabia during the Persian Gulf War, assessing them for PTSD and other psychiatric disorders using the SCID and standardized checklists. Current prevalence for Gulf War related PTSD was 46%, for major depression 25%, and for alcohol abuse/dependence 17%. Although their sample size was small, the value of their findings are bolstered by the fact that diagnoses were based on standardized interviews administered by trained clinical diagnosticians.

Southwick, Morgan, Nagy et al. (1993) studied 65 male and 19 female national guard reservists 1 month and 6 months after returning from military service in the Persian Gulf War. Diagnostic instruments included the M-PTSD, the Combat Exposure Scale (CES), a PTSD-DSM-III-R self-report rating scale, and a desert storm trauma

questionnaire designed to augment the ces with questions frequently experienced by personnel who served in that conflict. Relying on the M-PTSD alone, 3 subjects met criteria for PTSD at one month, and 4 others met PTSD criteria at 6 months (overall incidence within the 6 month period = 8%). Although women endorsed higher scores on both the PTSD checklist or M-PTSD on the initial and follow-up surveys, statistical analysis did not show these differences to be significantly different from men's scores.

Wolfe, Brown, and Kelly (1993) studied the differential effects of specific war-time stressors on men and women military personnel. They surveyed 2344 Persian Gulf War veterans (2136 men and 208 women) within five days of return from deployment in the middle east to Ft. Devens, Massachusetts. Combat exposure was measured by the Laufer Combat Scale, the Operation Desert Storm (ODS) exposure scale, and by qualitative descriptions by soldiers of their deployment stressors. The latter descriptors were categorized as combat/mission stressors, noncombat war zone stressors, domestic stressors, anticipation of combat events, physical hardships of the war zone, intra-unit conflict or "hassles," and the absence of specific stressors. Psychological effects of deployment were measured by the M-PTSD, the Brief Symptom Inventory (BSI), and a PTSD checklist derived from the DSM-III-R. Only 3% of men and 3% of women scored in the high level of the Laufer combat scale. There were no differences between men and women on the Laufer or ODS scales. It is important to note however, that males were more likely to be non-commissioned officers (NCOS) and married, while females were more likely to be enlisted and unmarried. On the qualitative descriptors, women soldiers reported significantly higher scores in the combat category. Women soldiers also scored significantly higher on the M-PTSD, the BSI, and the PTSD checklist. A higher percent of women scored above the clinical cutoffs for PTSD on the M-PTSD (women = 9.1%; men = 3.9%) and PTSD checklist (women = 30.8%; men = 18.3%). Women soldiers evidenced significantly more nightmares, avoidant thoughts, irritability, and exaggerated startle response.

Using scores on the M-PTSD, PTSD checklist, and BSI as a measure of psychological status, multiple regression analyses showed that female gender, lack of college education, lower rank, and serious marital problems were predictive of a worse outcome. The same situation was found for women but not men who had prior war-zone service. Women with high Laufer Combat scores had higher scores on the BSI than men in the same category. Witnessing deaths predicted significantly higher scores on the M-PTSD and PTSD checklist for women in comparison with men. Similarly, endorsing higher levels of experience of "major snafus," predicted higher M-PTSD and BSI scores for women than for men. Although this is one of the first studies to use sophisticated measures on such a large sample of male and female soldiers immediately after exposure to serious war-zone deployment, the authors caution that their study failed to adjust for social desirability in reporting psychological states, a situation that may vary by gender. Similarly they did not attempt to measure prior sexual or criminal victimization in their respondents.

Wolfe, Brown, and Bucsela (1992) found that female Vietnam veterans with prior Vietnam exposure had a higher increase in PTSD symptoms than a control group following initiation of Operation Desert Storm in the Persian Gulf.

Ross and Wonders (1993), studied a convenience sample of 234 (males = 182; females = 52) reservists within 3 - 6 months after deployment in Operation Desert Storm. Using the M-PTSD as a measure of PTSD, 5% of the sample scored above the diagnostic cut-off. They found no statistically significant differences between male and female reservists.

Gender Factors Influencing the Risk of PTSD

Comparing the prevalence of PTSD between populations of males and females can lead to erroneous conclusions unless one accounts for the effects of confounding variables such as rape or spousal abuse, that are known to be related to stress disorders. If these confounding variables are correlated with gender, it is important to do multivariate analysis to accurately assess the independent effect of gender on PTSD.

In military populations women are more likely to be subjected to non-combat related trauma such as sexual harassment, rape (Friedman et al., 1994), or spousal abuse (Magruder, Croutharmel, Mays et al., 1995). Pre-combat physical or sexual trauma may lead directly to posttraumatic symptomatology, or may serve as a predisposing factor for PTSD following subsequent exposure to combat-related events.

Magruder, Croutharmel, Mays et al. (1995) presented data showing that military populations may be at higher risk for spouse abuse. Although spousal abuse is a major public health problem in the U.S., the stress of military work may increase the risk as much as twice the civilian rate. Obviously, higher rates of physical battering in military populations will have significant effects on prevalence of PTSD, particularly for women, who comprise most of the victims. Abuse appeared related to deployment and to the nature of the marriage unit. For example, Magruder et al. (1995) found that women married to enlisted soldiers were at significantly greater risk for spousal abuse than wives of officers in 1994 (OR=11.5; 95% confidence limits (CL)= 9.3-14.3). Women soldiers, whether enlisted or officers, married to civilian husbands were the most likely to suffer spousal abuse (enlisted or=126.4; 95% CL=116.3-137.3; officers or=47.6; 95% CL=30.5-74.4). They reviewed data from the central registry for spouse abuse incidents in the Army. The vast majority of cases consisted of husbands battering wives. In 93% of cases, the victim suffered a minor physical injury. From 1989 to 1994 there were 4000 to 6000 substantiated cases each year, with an incidence per year ranging from 13.0/1000 to 16.0/1000 over this time period. Deployment had a significant influence on reported cases. For example, marriages involving an E2 reported a marked increase in reported abuse in 1990 during initial deployment of Operation Desert Storm. While many soldiers were away in 1991, abuse rates declined, only to increase in 1992 when troops returned home.

Engel, Engel, Campbell et al. (1993), studied pre-combat sexual abuse in veterans of the Persian Gulf War. They found that 34% of women reported a history of sexual abuse as opposed to 4% of men. Combining physical and sexual abuse, 57% of women suffered such pre-combat abuse, and 27% of men. Total pre-combat abuse was significantly related to PTSD scores for women but not for men. This was a retrospective study, and the authors acknowledged the problematic nature of their assessment measure for pre-combat abuse.

Bremner, Southwick, Johnson et al. (1993) found that childhood abuse plays an important role in later development of PTSD in men also. They studied 66 Vietnam consecutively admitted combat veterans from a PTSD inpatient unit ($n=25$), an outpatient PTSD clinic ($n=13$), and from a comparison group consisting of non-PTSD patients seeking treatment for medical problems ($n=28$). Patients with PTSD reported a significantly higher rate of childhood physical abuse than the comparison group (26% versus 7%); and a significantly higher rate of sexual abuse (8% versus 0%). Using logistic regression to control for level of combat exposure, the authors found that the childhood physical or sexual abuse was associated with a significantly increased chance of developing PTSD ($OR=9.4$).

The difference between reported rates of childhood sexual abuse varies considerably across studies of civilians, and is likely related to sampling and population characteristics. For example, in a study of university psychology students, Boudewyn & Liem (1995) found that 24% of the women and 16% of men reported childhood sexual abuse (CSA). There were no statistically significant differences between men and women in the frequencies of CSA, or in the type or onset of sexual abuse suffered. Furthermore, there were no sex differences in the likelihood of depression or suicide attempts following sexual abuse. Women were significantly more likely to have reported the abuse as children, and to express a greater level of current distress about it. Moreover, hierarchical regression analysis showed that CSA had more effect on women with regard to non-suicidal acts of self harm.

Comorbidity of PTSD with Other Psychiatric Disorders

Developing PTSD has been shown to be highly correlated with diagnosis of other psychiatric disorders. Much of the evidence suggests that for many individuals who develop a chronic or masked form of PTSD, co-morbid psychiatric diagnosis is related to the secondary effects of long-standing mental distress and disability. However, without adequate long-term prospective studies, it is difficult to differentiate the effects of genetic vulnerability and pre-existing psychiatric illness on the development of PTSD; moreover, it is not possible to specify based on existing evidence, the direction of causation (i.e., whether the trauma may have triggered the onset of other psychiatric syndromes besides PTSD. As previously mentioned, Mayou, Bryant, and Duthie (1993) found that patients developing depression/anxiety syndromes after road accidents did not necessarily overlap symptomatically with PTSD and travel anxiety patients, and were more likely to have suffered pre-existing emotional problems. Studies of gender-related effects on co-morbidity are important not only from the standpoint of prevention and treatment, but in furthering our understanding of the relationship between gender, trauma and other psychiatric disorders.

Helzer, Robins, and McEvoy (1987) found that PTSD shared considerable co-morbidity with other psychiatric disorders. Individuals who met the diagnostic criteria for PTSD had an increased risk for developing Obsessive-Compulsive Disorder (odds ratio = 10.1); Dysthymic Disorder (or = 7.8); and Manic-Depressive Disorder ($OR= 5.7$). Women with PTSD showed an increased risk for co-morbid Panic Disorders (or = 3.9), whereas men did not show such an association. Nearly 80% of individuals with PTSD had another psychiatric disorder (see Table 3).

Table 3
Prevalence of Comorbid Conditions Occurring in Association With PTSD

Authors	Sample	<i>n</i>	Comorbidity (Odds Ratio or %)
Helzer et al., 1987	<i>ECA Sample, women PTSD versus women with no PTSD</i>	1528	
	Alcoholism		OR = 2.8
	Antisocial personality disorder		OR = 3.8
	Drug abuse/dependence		OR = 1.4
	Dysthymic Disorder		OR = 6.2
	Manic Depressive Disorder		OR = 4.2
	Obsessive Compulsive Disorder		OR = 9.4
	Panic Disorder		OR = 3.9
	Phobias		
	<i>ECA sample, men with PTSD versus men with no PTSD</i>	965	
	Alcoholism		OR = 1.9
	Antisocial personality disorder		OR = 5.7
	Drug abuse/dependence		OR = 5.0
	Dysthymic Disorder		OR = 9.9
	Manic Depressive Disorder		OR = 12.3
	Obsessive Compulsive Disorder		OR = 8.9
	Panic Disorder		OR = 0.0
	Phobias		OR = 0.0

Table 3, continued

CDC VES (1988)	<i>U.S. Army enlisted men, Vietnam service</i>	2490
	Alcohol abuse or dependence	13.7%
	Depression	4.5%
	Generalized Anxiety Disorder	4.9%
	<i>U.S. Army enlisted men non-Vietnam service</i>	1972
	Alcohol abuse or dependence	9.2%
	Depression	2.3%
	Generalized Anxiety Disorder	3.2%
Shore et al., 1989	<i>NW rural community, women with PTSD</i>	510 (PTSD: <i>n</i> = 16)
	Alcohol	23.8%
	Antisocial	.0%
	Depression	61.9%
	Drugs	9.5%
	Generalized Anxiety Disorder	95.2%
	Mania	4.8%
	OCD	.0%
	Panic	4.8%
	Phobia	47.6%
	<i>NW rural community, men with PTSD</i>	515
	Alcohol	31.3%
	Antisocial	12.5%
	Depression	37.5%
	Drugs	6.3%
	Generalized Anxiety Disorder	50.0%
	Mania	6.3%
	OCD	25.0%
	Panic	12.5%
	Phobia	18.8%

Table 3, continued

Breslau et al., 1991	HMO Detroit, men and women with PTSD versus those without PTSD	PTSD: <i>n</i> = 93; no PTSD: <i>n</i> = 914
	Agoraphobia	OR = 6.4
	Alcohol abuse/dependence	OR = 2.2
	Drug abuse/dependence	OR = 2.8
	Dysthymia	OR = 6.1
	Generalized Anxiety Disorder	OR = 2.8
	Major Depression	OR = 4.4
	Mania	OR = 6.1
	OCD	OR = 10.3
	Panic	OR = 5.7

The Centers for Disease Control (CDC) Vietnam Experience Study (VES) (1988) found an increased risk of several co-morbid conditions in male enlisted Army veterans who served in Vietnam in comparison with a similar group who served elsewhere. These conditions included alcohol abuse or dependence (OR=1.5), Generalized Anxiety Disorder (OR=1.5) and depression (OR=2.0) (see Table 3).

In a community study, Shore, Vollmer, and Tatum, (1989) found a significantly higher prevalence of co-morbid psychiatric diagnoses among women suffering from PTSD than men. Women with PTSD were 1.5 to 2.5 times more likely to be diagnosed with depression, GAD, and phobia (see Table 3).

Breslau, Davis, Andreski et al. (1991) found a higher prevalence of other psychiatric disorders in 93 subjects in their sample of 1007 who met criteria for PTSD. The highest odds ratios comparing co-morbidity in PTSD subjects versus non-PTSD subjects included Obsessive Compulsive Disorder (OR=10.3); Agoraphobia (OR=6.4) and Dysthymia (OR=6.1). They did not differentiate prevalence of co-morbidity by gender.

Jordan, Schlenger, Hough et al. (1991) studied the prevalence of other psychiatric diagnoses besides PTSD on the NVVRS sample. They employed DIS measurements to assess differential rates of illness. There were some significant differences between female Vietnam-theater veterans (12.1%) and both female Vietnam era veterans (6.1%) and female civilian controls (5.3%), with regard to lifetime prevalence rates for having suffered a depressive episode. Female theater veterans also had significantly higher lifetime prevalence rates for alcohol abuse/dependence (9.1%) in comparison with female era veterans (4.9%) and female civilian controls (1.8%). Corresponding findings for lifetime co-morbidity prevalence rates with males showed significant differences only between male Vietnam theater veterans and male civilian controls with regard to having a depressive episode (5.1% versus 1.5%), dysthymia (4.2% versus 1.2%), obsessive-compulsive disorder (1.8% versus 0.3%), alcohol abuse/dependence (39.2% versus 25.2%), and antisocial personality disorder (9.5% versus 4.0%).

The following case history illustrates the interaction between PTSD and alcohol abuse. This vignette is a summarized version of a more complete case history published by Brown (1986) about a Vietnam nurse whom she treated in psychotherapy:

At the time of intake, the patient was 39 and referred by a VA alcohol treatment program. She had been a military nurse in Vietnam from 1969 to 1970, where she began to suffer increasingly severe symptoms of PTSD that she medicated with alcohol. In Vietnam she was assigned to a hospital where she experienced the threat of frequent mortar shelling and terrorist attack. She encountered many maimed and dead bodies, severe burns, and traumatic amputations, both on and off duty. She began her first sexual relationship with a married physician that she experienced as emotionally and sexually abusive. She persisted in this involvement because of her desire for protection in a chaotic environment. Upon return to the U.S., she developed pain, chills and fever that were attributed to a psychosomatic condition for which she placed on a psychiatric ward for an extended

admission. She began to drink more heavily to palliate the physical and mental pain. A correct diagnosis of tuberculosis was finally made. She was treated for four years by a psychiatrist who prescribed valium for her, but felt she was discouraged from discussing her Vietnam experiences in the treatment. Although she entered graduate school, she dropped out and gave up her nursing license and took a job as a salesperson. She withdrew from almost all of her family. By the early 1980's, she found that alcohol could no longer suppress her psychological symptoms, and began to experience frequent visual hallucinations and nightmares of bodies, and olfactory hallucinations of the smell of the bacterial infections so common in burn victims. She became hyper-alert to the sound of helicopters and would experience flashbacks to Vietnam when she heard them. She had nightmares of being sought and hurt by badly wounded men. In a peer-support group for Vietnam veterans, she was confronted with her alcoholism and entered a treatment program, and was referred for outpatient psychotherapy. At the time of entering treatment she had chronic anxiety associated with impairments in her ability to think or speak. She was suicidal and engaged in self-mutilation, cutting the back of her hands with sharp objects. This behavior provided tension relief, and enabled her to cry or to sleep. She was quite self-demeaning, and expressed doubts about whether her symptoms were real or if she were fabricating them to get attention.

Mellman, Randolph, Brawman-Mintzer et al. (1992) studied 60 combat veterans from Vietnam, Korea, and World War II referred to a mental health program for PTSD, in order to determine co-morbidity and course of disease. Patients with recent history of substance abuse, psychosis, or current need for inpatient treatment were excluded to reduce the confounding effect of these factors on disease course. Fifteen of the veterans had been prisoners of war. Patients were evaluated clinically using structured research diagnostic measures including the SCID DSM-III-R module. Results showed that 22% of the sample reported a history of psychiatric illness in a family member, and 30% reported significant trauma prior to age 12. The patients had an average number of 3.1 lifetime diagnoses. Lifetime prevalence for disorders included 82% with full criteria for PTSD, an additional 18% met partial criteria for PTSD, 68% met full criteria for Major Depression; 55% for Panic Disorder; 53% for Generalized Anxiety Disorder; and 33% for Phobia. A past history of alcohol or substance abuse was present in 32%. Sub-syndromal criteria for Obsessive Compulsive Disorder was found in 20%, and 15% had experienced hypomanic episodes. In all cases except one, PTSD onset occurred within 6 months after the stressful combat exposure. Onset of Panic Disorder, Phobic Disorder, and Depression occurred on average, significantly later than onset of PTSD. Generalized Anxiety Disorder and Alcohol/Substance use disorders did not occur significantly later than onset of PTSD.

Wolfe, Schnurr, Brown et al. (1994) studied 109 female Vietnam theater veterans using the Women's War-Time Stressor Scale (WWES) as an assessment instrument specially developed to measure combat exposure by female Vietnam veterans (Wolfe, Brown, Furey et al., 1993). The M-PTSD was employed to measure PTSD symptoms, and respondents rated their past and current physical health status according to nine major health problems. PTSD cut-off scores showed that 27.5% of the sample met M-PTSD

criteria for an non-clinical sample. Although respondents rated their health as average to good, they reported that it had declined during Vietnam and after the war. As expected, war-zone exposure correlated significantly with PTSD ($r = .53$). Controlling for this correlation between PTSD and war-zone exposure with a combined regression analysis, and adjusting for other variables such as age, education, and pre-Vietnam health status, the results suggested that the stronger more direct adverse effect on perceived physical health in these veterans, was mediated through PTSD symptomatology rather than war-zone exposure. PTSD scores in the combined regression significantly predicted perceived health problems in the following systems: cardiovascular, gastrointestinal, gynecological, dermatological, ophthalmological or otolaryngological, and pain.

The CDC VES study (1988b) revealed that Vietnam theater veterans on average, reported higher levels of current and past physical health problems than non-Vietnam veterans. Medical examinations revealed few objective differences between the two groups of veterans.

Masked symptoms of PTSD provide a reasonable explanation for the discrepancy between higher reports of physical health problems combined with few objective findings on medical examination, particularly in light of the "self-cloaking" aspects of this disorder with avoidant symptomatology (Epstein, 1993). This point of view is supported by the findings cited above by Wolfe, Schnurr, Brown et al. (1994), and by the work of Benedikt and Kolb (1986), who studied 225 veterans referred to a chronic pain clinic, and found that 10% were later found to be suffering from PTSD.

Gender Roles and the Experience of Traumatic Events

A huge literature on the effects of gender role on health and adaptability to stress has identified a number of biological and social variables that have a potential influence on outcome. It is difficult to summarize this literature because stress response is often context specific and confounded by other variables besides gender such as age, income, job status, race, and education. In general, social and demographic factors appear to play a more important role than sex in affecting stress response.

A number of authors have expressed concern about ways gender-related research findings may be misconstrued (O'Neil, 1981; Bleier, 1993; Beall, 1993; Geis, 1993). Geis (1993) argued that gender stereotypes may have profound effects on the way research findings are interpreted. A recent study by Lurie, Bar-Tal, and Glick (1995, personal communication) compared the perceived level of war and work-related stress exposure, coping methods, and measured psychological distress in Israeli Army officers and in a group of civilian females (military females = 66; military males = 64; civilian females = 47). Although the female Army officers reported greater perceived stress than male officers and female civilian controls, they demonstrated more active behavioral coping. In addition, female officers' social support seeking was more effective than the other two groups, and their active behavioral coping was equivalent to that of the male officers. After controlling for the level of perceived stress exposure, both female and male officers suffered from lower psychological distress than the female civilians. Had the authors confined their

analyses to univariate measures of stress and psychological distress alone, they might have concluded that female officers were not as well adapted to their roles as their male counterparts. They were alert however, to the fact that higher perceived stress exposure could also be a sign of female officers' greater willingness to report emotions, and that male officers may feel more stigmatized by them. After controlling for the relationship between the variables, they found that the female officers were more similar to their male counterparts than to the female civilians, and that their coping behavior was more related to their role as Army officers than to their sex. This study demonstrates how easily technically sound research can be interpreted in diametrically opposite ways, depending on the questions that are asked, and the way the data are analyzed.

In addition to potential bias in gender comparison research, it is valuable to consider the underlying assumptions that may interfere with the morale and operation of the military. Discriminatory gender bias can exist in a covert form in any social institution, even if a majority of the population and its leaders are committed to achieving equality. Such discrimination can have negative effects on the morale and psychological health of individuals comprising the organization, as well as to the functioning of the organization itself.

As noted in the previous section on historical perspectives, gender stereotypes and cultural norms at any given period of time have had profound effects on the role and power given to females in a society. Variations over the course of history in the degree to which women have been allowed to participate in war suggest that these gender based schemata are more likely related to factors other than women's actual abilities in combat or their contributions to victory.

Discriminatory gender bias can be defined as the assumption that all males are better than all females in any given social or occupational function. Gender-labeling is one of the first ways that toddlers categorize people (Jacklin & Reynolds, 1993). That is, the maladaptive aspects of gender discrimination seem to be based on stereotyped assumptions deriving from a vicious cycle of misattribution. When unable to mount an effective resistance, people who are abused, devalued, or otherwise treated badly, are prone to develop symptomatic behavior such as passivity, disguised emotional expressions of dismay, withdrawal, depression, anxiety, and psychosomatic disorders. These behaviors then may be subject to misattribution by the aggressor, and taken as a sure sign of the victim's innate weakness. It thereby serves to reinforce the aggressor's belief that the victim deserves his or her mistreatment. Wenegrat (1995) argued that this mechanism explained much of the confusion centering around symptoms of hysteria experienced by women in the 19th century. Gender discrimination in the military can be highly stressful for female personnel because it places them in double binds and has the potential to impair their effectiveness (Schneider & Schneider, 1991; Rustad, 1991).

Lott and Maluso (1993) reviewed an impressive array of evidence indicating that many of the observed gender differences in behavior are actually a function of social learning; moreover, in studies showing statistically significant sex differences in behavior (e.g. aggressiveness) sex typically explains no more than 5% of the variance.

Maloney (1988) reviewed evidence consistent with the idea that military institutions encourage a group culture based on a sense of hypermasculine invulnerability. Such a culture may promote confidence in the face of danger, and facilitate a breakdown of the cultural prohibition against murder. According to Maloney, the effect on young men who are typically recruited in their late adolescent stages of development has been to promote a regressive dependency on an idealized masculine forcefulness that is sustained by projecting all weakness into the feminine aspects of humanity. Inasmuch as it seeks intimacy and connection, femininity is equated with frailty and vulnerability. Women themselves tend to become partially dehumanized by this process of thinking; furthermore, this hypermasculine position results in a regression to a controlling and sadistic view of sexuality, a process that may be reflected in the nature of the relationships. In a sample of marriages between Vietnam veterans with PTSD and their physically abused wives, Maloney observed the effects of this regression. One of her respondents reported of her husband:

"It's like he stopped growing. He went to nam from high school at age 18. He came back and was still an 18-year-old kid who thought his mom would still pay his grocery bill-- or that I would."

Morrier (1984) presented case descriptions of male combat veterans and provided a theoretical analysis of the dangers to normal development faced by older adolescents exposed to combat trauma. His thesis was that society and its military chain of command subsume an external superego function that allows killing in the service of defending the country. In the face of this, young men who have not yet progressed in ego development to the point where they can deal maturely and effectively with their own aggressive impulses and primitive superego restrictions are highly vulnerable to regression to an anal-sadistic mode of thinking. There is a danger that this process which is intended to protect and toughen troops, may also promote an internal passivity in the face of trauma. Internal passivity can be viewed as an immobility in the ability to deal with intrapsychic pressures such as irrational guilt, loss of self-esteem, and rage. Internal passivity in the face of repetitive traumatic memories may interfere with the adaptive resolution of these experiences, and lead to increased vulnerability to PTSD.

O'Neil (1981) emphasized the potential adverse effects of rigid sex-role assumptions on the health and adaptive coping of both men and women. He reviewed studies linking a type of masculinity that is defined solely by economic success and dominance, with a stereotyped masculine expectation for restrained emotionality, competitiveness, orientation toward power and control of others. All of these factors appear to contribute to overwork, lack of sensitivity to others, a tendency towards competitive manipulateness rather than cooperation, impaired trust, and failure to attend to psychological and internal body signals that serve as warnings of impending health problems. These are qualities that may lead to both adaptive and maladaptive functioning in military organizations.

Dutton, Burghardt and Perrin (1994) emphasized the importance of the meaning of a potentially traumatic event assigned by the subject, as opposed to external "objective" assessments of its significance. They studied 72 battered women from an outpatient family

violence clinic to determine the cognitive structure of the respondents's self-schemas along with the cognitive attributes of the repeated violence to which they had been exposed. The meaning of their experiences and the causal attribution they inferred from the violence they suffered, explained much of the variance in their self-schemata. It was not significantly explained by cognitive schemata based on sexual (as opposed to physical) victimization by the physically abusive spouse, or by sexual abuse in childhood. For example, self-blame or internal attributions for the cause of prior violence seemed to be a significant factor in explaining why a battered women would have trouble trusting herself, when combined with the expectation of future violence. These negative core beliefs and attributions are critical factors in understanding the pathological process and in conducting effective treatment.

Comparable processes have been observed to operate for female rape victims. Lebowitz and Roth (1994) demonstrated the mechanism by which women organized being raped around pathological latent social constructions of the feminine sexual role. These regressive schemas are usually quite antithetical to healthy self-regard. Among these beliefs are the idea that having been raped is evidence of a woman's lack of chastity, and that her sexual boundaries were not hers to control in the first place, but rather the prerogative of a protective male.

The meaning of military service is affected by the gender-specific roles of those who serve. Thomas and Thomas (1993) outlined some of the dilemmas faced by military women who are also mothers. These issues affect the morale of women in the service, and may play an important function in subsequent stress reactions. Issues include having to endure skepticism about their value to their organizations, dealing with male preoccupations with female sexuality, moralizations about their having misplaced loyalties in their dual roles as mothers and soldiers, and constant comparisons to male standards.

Parents with more than one child, or single parents with custody of a child have restrictions on enlistment in some of the services. Despite the fact that marital separation policies are not gender specific, Thomas and Thomas (1993) cited data showing that military mothers seem to be discharged from service more frequently because of parenthood. For example, in the Navy in fiscal year 1990, 0.91% of women were discharged for parenthood, as opposed to 0.05% of men. During the Persian Gulf War, 35,000 of 541,000 troops were women. Of these troops, 16,300 were single parents with custody of their children, and 1200 were members of a couple with children in which both parents were deployed. Thomas and thomas estimate that 12,000 mothers served in Operation Desert Storm, and newsweek called it the "mom's war." Public opinion was divided on the issue of mothers serving in this capacity. There was praise in some quarters for these women who served their country, and criticism from others. The press and child advocates raised concerns about children feeling abandoned as a result of being sent to relatives during gulf war deployment, and traumatized by the news reports of the war when they knew their mothers were serving in the middle east. Potentially guilt-inducing newspaper headlines such as "even while their country called, so did their children," may have a negative impact on the morale of female troops. Thomas and thomas pointed out that the same arguments could be raised for fathers.

Thomas and Thomas (1993) reviewed data on the sexual harassment of military women on bases and in the naval academy. They argue that throughout history military women have had to endure rumors, or snide innuendoes about their sexual orientation or their promiscuity. They cited Martindale's 1989 survey of 38,000 military personnel showed that 71% of the women had experienced three or more forms of sexual harassment. They cited womens' complaints over the statistics being kept on female military pregnancies but not on male sports injuries that caused more casualties during the war, or that two thirds of military single parents with custody of a child are men.

Thomas and Donnellan (1993) pointed the contradictory findings in the literature regarding the negative impact of "role overload" for women who feel burdened by conflicting demands such as caring for children, elderly parents and job responsibilities, and argue that perceived stress is correlated more with loss of a sense of mastery than multiple responsibilities. They found that in general, higher levels of stress were significantly correlated with anger, most strongly with measures of somatized anger (e.g. "there is a tight knotted feeling in my stomach"); blaming and attacking forms of expression; anger cognitions (e.g., construing a situation as unfair, obsessing or ruminating about an incident); and trait anger (e.g. "I fly off the handle"). Trait anger has been found to correlate with variables such as trait anxiety, lower levels of self-efficacy, beliefs that life rewards are due to luck or fate, and higher blood pressure.

Compared to others, women reporting high levels of stress scored significantly higher on measures of somatic anger (heart pounding, body keyed up, face and mouth tight, tense, and hard). Findings from Thomas and Donnellan's (1993) survey research showed that successful management of multiple tasks may actually serve to enhance womens' sense of well-being, with one role serving as a buffer against stresses arising from the others. Women who had the greatest number of responsibilities, i.e. wife, mother, worker, scored the lowest on anger proneness when compared with other women. Lack of authority, control or influence in work or home environments, role conflict, and work imposing on relaxation, appeared to be the most stressful factors. The tendency for women to take on "vicarious stress" through their connection to others in their family or social networks also appeared to be increase stress. In contrast, these networks may also serve as buffers against stress inasmuch as they are used to obtain information for problem solving, self-esteem, encouragement, and modulate feelings such as hopelessness, hostility, shame, or guilt. The termination of relationships and death or physical health problems, were associated with high levels of reported stress. Affective support (a sense of feeling loved or admired) was negatively correlated with perceived stress and cognitive anger. There were weak, but significant correlations between anger and feeling unloved, having a small network size, relationships that were not long lasting, and infrequent contacts with the individual's network.

Biological and Psychophysiological Correlates of PTSD

Research on PTSD has revealed many biological correlates of PTSD. Individuals with PTSD manifest prominent symptoms of increased physiologic arousal such as rapid heart rate and sweating following exposure to trauma specific reminders. Laboratory

observations reveal increased catecholamine output, diminished opioid output, and impaired output of adrenal cortical hormones (Kosten, & Krystal, 1988; Burges Watson, Hoffman, & Wilson, 1988; Hoffman, Burges Watson, Wilson et al., 1989; de Bellis, Lefter Trickett et al., 1994; Yehuda, Kahana, Binder-Brynes et al., 1995). McFall, Veith, and Murburg (1992) suggest that many of these alterations in biochemical measures may be more related to stress induced phasic responsiveness than to higher tonic levels of autonomic functioning.

Biological Effects of Stress

Van der Kolk (1987b) employed the model of inescapable shock in experimental rats to explain many of the symptoms of PTSD. He postulated that an increased outflow of noradrenergic neurons from the locus ceruleus to the hippocampus and amygdaloid complex could explain the traumatically vivid remembering of PTSD, since these structures are crucial in short term memory functioning. More recent studies with rats show that inescapable shock sensitizes the hippocampus, and results in a more rapid response to attenuated stressors that are subsequently applied (Petty, Chae, Kramer et al., 1994). This latter finding could explain traumatic flashbacks and the painfully intrusive remembering experienced by PTSD patients following symbolic reminders of the trauma.

An increase in beta-endorphin sensitivity found in experimental animals may reduce sensitivity to pain, while at the same time create a physiologic state of opiate tolerance. Van der Kolk (1987b) argued that an attempt to relieve this functional endorphin deficit might be related to the clinical manifestation of "addiction to trauma" observed in PTSD patients who repeatedly and compulsively engage in behaviors highly reminiscent of their own horrific experiences. Resting plasma beta-endorphin levels were found to be similar in Vietnam veterans with PTSD compared to matched controls, but were significantly higher in the PTSD patients in response to exercise (Hamner & Hitri, 1992). Evidence supporting the opioid-mediated analgesia hypothesis was found when Pittman, van der Kolk, Orr et al. (1990) exposed Vietnam veterans with PTSD to traumatic reminders. In the veterans with PTSD but not in controls, there was 30% reduction in pain threshold that was blocked by injection with naloxone, a short-acting opioid antagonist.

The clinical implications of altered opioid metabolism in patients with PTSD was underscored by Ibarra, Bruehl, McCubbin et al. (1994), when they administered the opioid antagonist naltrexone to a young man with PTSD, during a blind test of that agent on blood pressure. He developed a headache along with screaming rage, explosive behavior, visual sensory distortions, and a significant increase in his blood pressure for 24 hours. These findings suggest clinically important alterations in opioid metabolism in PTSD. In contrast, Glover (1995) reported improvement of symptomatology was noticed in an open trial of 18 combat veterans with PTSD with high doses (320-400 mg/day) of nalmefene, another oral opioid antagonist. At lower doses, nalmefene appeared to cause an unpredictable waxing or waning of PTSD symptoms. Glover suggested that the findings in the case report by Ibarra, Bruehl, McCubbin et al. (1994) might be explained by the fact that their patient was on a lower dose of naltrexone.

Changes in neural serotonin outflow in individuals with PTSD has been suggested by recent findings showing the usefulness in PTSD of selective serotonin reuptake inhibitors (SSRI's) and other serotonergic agonists such as buspirone and fluoxetine (van der Kolk, Dreyfuss, Michaels et al., 1994; Wells, Chu, Johnson et al., 1991). The role of serotonin in PTSD is further supported by Fichtner, Arora, O'Connor et al. (1994), who studied Vietnam veterans with PTSD, and found that maximal treatment responders to the SSRI paroxetine had significantly lower pretreatment paroxetine binding to platelets.

Wolfe and Charney (1991) emphasized the importance of studying neuropsychological deficits in patients with PTSD because of the cognitive problems commonly associated with the condition (e.g., amnesia and loss of concentration). The Centers for Disease Control (CDC) Vietnam Experience Study (VES) (1989) conducted a comprehensive battery of neuropsychological tests, on Vietnam theater and non-theater veterans. Comparing veterans by level of military occupational specialty or level of combat exposure, except for greater risk of deficit in the grooved pegboard test in the non-dominant hand for veterans with the highest level of combat ($OR=1.6$), and a greater risk of deficit on the paced serial addition test (PASAT) in veterans with the highest level of exposure to herbicides ($OR=2.6$), they found no significant differences in the degree of cognitive deficits on 15 neuropsychological tests between groups.

Cognitive impairment in PTSD may be related to a variety of factors. Certain traumas such as physical torture or prisoner-of-war status are correlated with cognitive impairment. Brain injury concurrent with traumatic stressor may result in a co-morbid condition (Epstein & Ursano, 1994). Diagnostic confusion is most likely when "mild" head injury is suspected, because symptoms of post-concussive syndrome have considerable overlap with symptoms of PTSD (Epstein & Ursano, 1994), and because avoidant symptoms with partial amnesia may lead to an erroneous diagnosis of traumatic brain injury (Epstein, 1993). In general however, unconscious status from concussion at the time of traumatic injury appears to protect against future development of PTSD (Mayou, Bryant, & Duthie, 1993).

In addition to the question of whether PTSD causes cognitive impairment, it is important to assess whether preexisting cognitive problems affect the risk or severity of PTSD after exposure to stress. Low intelligence has been correlated with higher risk for severity of PTSD symptoms. McNally and Shin (1995) found that lower intelligence scores correlated with higher M-PTSD scores in male Vietnam combat veterans. Calculating the statistically significant contributions made by combat exposure and low intelligence to PTSD severity, they found that combat exposure accounted for 17% of the variance, and that low intelligence contributed an additional 10%. They suggested that impaired coping resulting from cognitive impairments may increase the risk for chronicity in PTSD.

Kolb (1987) postulated that psychological trauma may be neurotoxic in and of itself, and that this effect is mediated by the selectively deleterious action of high levels of adrenal steroids on cortical structures, such as the temporal-amygdaloid complex. He reasoned that diminution in the functioning of these structures causes disinhibition of activated brain stem structures. Kolb's cortisol neurotoxicity hypothesis has found support with the recent work of Bremner, Randall, Scott et al. (1995), who conducted cerebral

mri's and cognitive testing on 26 male Vietnam veterans with PTSD and a matched comparison group. They found that the PTSD group had smaller (8%) right hippocampal volume, and showed relative decrements on the wechsler memory scales logical component (verbal memory) for immediate recall, delayed recall, and percent retention. The mean decrements in these scores were robust (one to two standard deviation differences). Severity of PTSD as measured by M-PTSD scores did not correlate with right hippocampal volume. Deficits in verbal memory were associated with decrements in right hippocampal volume ($r=0.64$).

Studies of sleep function in PTSD have shown that patients with PTSD demonstrate a dysregulation in their rapid eye movement (rem) sleep control system, inasmuch as they evidence a higher percentage of tonic and phasic rem sleep epochs, and higher levels of periodic limb movements during non rem sleep (Ross, Ball, Dinges et al. (1994a, 1994b).

Twin studies of PTSD have begun to shed light on the relative roles of genetics and environmental factors. Using published data from the Vietnam Era Twin Registry (VET), Goldberg, True, Eisen et al. (1990) demonstrated the importance of combat exposure on the onset of PTSD by controlling for genetic factors. They surveyed 2092 monozygotic twin (MZ) pairs (4184 individuals) who were either concordant or discordant for service in Southeast Asia (SEA) during the Vietnam war era. For the 715 MZ twin pairs discordant for sea service (i.e. one of the twins of each pair served in sea and the other twin was deployed elsewhere), the current prevalence of PTSD was 16.8% for the sea service twins, and 5.0% for the non-sea twins, highlighting the role of combat exposure in the development of PTSD. Examination of current PTSD prevalence rates in two comparison groups consisting of 950 MZ twin pairs concordant for non-SEA service, and 427 MZ twin pairs concordant for sea service, showed that there were no differences between discordant twins who served in sea and the concordant twins who served in sea, nor between the discordant twins who served elsewhere and the concordant twins who served elsewhere.

In a study of the same VET data, Lyons, Goldberg, Eisen et al. (1993) employed structural equation modeling methods to compare the correlation between MZ twin pairs and dizygotic (DZ) twins (total of 4029 MZ and DZ pairs) for their wartime exposure to traumatic events during the Vietnam era. MZ twins had significantly higher correlation for service in sea, for combat exposure, and for receiving a military decoration. Structural models estimated that genetic factors accounted for 47% of the likelihood of combat exposure, as opposed to 6% that could be explained by common environmental factors.

In an effort to determine the effects of genetic factors on the likelihood of developing symptoms of PTSD, while accounting for level of combat exposure, True, Rice, Eisen et al. (1993) analyzed the same vet data and found that MZ twins as a group had higher correlations with each other than DZ twins for all PTSD symptoms. They interpreted the structural equations derived from this data as indicating that heritability made a substantial contribution to susceptibility to developing PTSD symptoms, whereas childhood and adolescent environmental factors did not.

Kendler, Kessler, Walters et al. (1995) studied 1082 female twin pairs (approximately 57% MZ, 43% DZ) from the Virginia Twin Registry to determine the relative effects of individual personal stress and heritability on the onset of major depression. For MZ twin pairs concordant for having not been affected by prior major depression (low genetic risk pairs), the monthly probability of onset of a new episode of major depression was 0.5% for the non-stressed individuals and 6.2% for the stressed individuals. For MZ twin pairs concordant for having been affected by prior major depression (high genetic risk pairs), the monthly risk for a major depressive episode was 1.1% for those who were not stressed, and 14.6% for those who were stressed. From these findings the authors concluded that genetic factors increase the risk of major depression by enhancing the sensitivity of individuals to the depressogenic effects of stressful events.

Gender Differences in Stress Response

Notman and Nadelson (1991) emphasized how difficult it is to separate "biological" characteristics from psychological manifestations of gender role socialization, since psychological processes affect biology. Although there are findings of sexual differences in stress response that have been credibly received by the scientific community, the validity and operational significance of these results are yet to be determined. Bleier (1991) emphasized the importance of using extreme caution in interpreting biological research of this type. She outlined some of the flawed studies that led to premature assumptions about sex differences in hemispheric lateralization, and visuo-spatial processing. Research flaws included trivially small effect size, inadequate sampling, poor statistical analysis, and failure to account for publication bias against studies that report negative findings (i.e., negative effect studies are less likely to be published). Findings described in this section regarding biological differences in response to stress are summarized in Table 4.

Shore, Vollmer, and Tatum (1989) found in their community sample that women with PTSD were significantly more likely to experience motor tension, apprehensive expectation, vigilant motor scanning, and autonomic hyperactivity.

Yehuda, Kahana, Binder-Brynes et al. (1995) extended their previous findings of suppressed cortisol suppression in combat veterans with PTSD, by comparing a non-treatment seeking cohort of 28 men and 34 women who were survivors of the holocaust and who had been interned in nazi concentration camps, along with a matched non holocaust survivor control group. All of the women were post-menopausal. Survivors with PTSD had significantly lower urinary 24-hour cortisol excretion than survivors without PTSD and the control group. There were no significant cortisol excretion differences by gender, and no group by gender interactions. There was a negative correlation between the avoidance subscale of the clinician-administered PTSD scale and urinary cortisol excretion ($r = -0.49$). Holocaust survivors without current symptoms who met criteria for past PTSD did not have significantly lower urinary cortisol levels, suggesting that urinary cortisol is an indicator of current symptomatology only.

Llabre and Hadi (1994) studied a stratified random sample of 101 Kuwaiti girls and

90 Kuwaiti boys between the ages of 8 and 12 following the Persian Gulf War of 1991, to determine the effects of their experience during Iraqi occupation. There was no difference in the level of exposure between boys and girls. Both groups evidenced a significant

Table 4

Studies of Sex Differences in Biological Response to Stress

Study	Measure	Sex Difference
Shore, Volmer, & Tatum 1989 <i>Subjects with PTSD</i>	degree of motor tension vigilant motor scanning apprehensive expectation autonomic hyperactivity in persons with PTSD	females > males
Shalev et al., 1993 <i>Israeli adults with non-combat PTSD</i>	physiologic measures	females = males
Grossman & Wood, 1993 <i>Undergraduate students</i>	facial EMG responsivity to negative or positive stimuli	females > males
	facial EMG responsiveness to enhancing emotional expression	females > males
	facial EMG responsiveness to inhibiting emotional expression	males > females
Llabre & Hadi, 1994 <i>Kuwaiti boys and girls after Iraqi occupation</i>	reactivity of pulse and BP to discussing events	females > males
Yehuda et al., 1995 <i>Holocaust survivors</i>	24-hour urinary cortisol	females = males

increase in somatic complaints when compared with their pre-war status. Tests of cardiovascular reactivity (pulse rate, systolic, and diastolic blood pressures) were conducted during interviews in which the respondents were asked to speak about the crisis. Girls evidenced higher resting systolic blood pressures and pulse rates than boys.

From a population of Israeli civilians, Shalev, Orr and Pitman (1993) studied 13 who suffered from current non-combat related PTSD (4 women and 9 men) and compared their physiological reactivity with a control group selected for having suffered similar non-combat related trauma, but who had never developed PTSD (7 women and 6 men). Both groups listened to prepared scripts that described the specific traumatic event each individual had personally experienced, and included standardized scripts on other topics. Measurements recorded during the reading of each script included heart rate, skin conductance, frontalis EMG, SCID for DSM III-R, M-PTSD modified for non-combat trauma, the IES, and the State-Trait Anxiety Inventory (STAI). The PTSD group did not differ significantly from the non-PTSD group with regard to rated severity of the personal traumatic events, but scored significantly higher on both the intrusion and avoidance scales of the IES, on the M-PTSD, and the state and trait scales of the STAI. The PTSD subjects also evidenced greater physiological reactivity during the reading of the personal traumatic scripts. Analysis of covariance showed no group differences with regard to gender, age, time elapsed since the trauma, or rated severity of the event. Although female subjects with PTSD had physiological responses that were 33% greater than those of the male PTSD subjects, these differences did not reach statistical significance, possibly because of the small group sizes.

Grossman and Wood (1993) argued that research showing a more intense style of emotional expression in women was a function of socially-programmed gender role expectations. Such differences in enactment of caretaker roles by women is more likely to involve them in sensitivity to the needs of others than men. Their research with male and female undergraduate students showed that women reported higher levels of emotion than men on all measurements except anger. The authors also observed a relationship between self-ratings and the subjects' beliefs about gender differences in expression. Grossman and Wood (1993) employed facial electromyographic studies (EMG) combined with experimental inhibition or accentuation of expression (i.e., subjects were told that either increased or decreased expression was a sign of good psychological adjustment). Overall, women showed a higher facial emg responsiveness to both negative and positive emotional stimuli than men. Women were more successful in enhancing emotional response, and men at inhibiting emotional response.

Gender-Related Psychological Differences in Response to Stress

In this section, studies are reviewed that shed light on some of the differential responses of males and females on stress-related psychological measures (see Table 5). Billings and Moos (1981) studied a sample of 194 couples and measured frequency of negative life events, coping responses, social resources, and mood and symptom measures. There were no differences between men and women in event severity. Women were found to use active behavioral coping methods more frequently than men

Table 5*Sex Differences in Psychological Response to Stress*

Study	Measure	Sex Difference
Kessler & McLeod, 1984 <i>women and men in labor force</i> <i>women homemakers</i>	psychological distress to financial loss psychological distress to network loss	males > females females > males
Rosario et al., 1988 <i>health professionals</i> <i>university students</i>	coping with job stress	females = males
Klingman & Kupermintz, 1994 <i>Israeli university students during Persian Gulf War</i>	emotional responses trait anxiety	females > males females = males
Bar-Tal, Lurie, & Glick, 1994 <i>Israeli enlisted soldiers</i> <i>SCUD missile attacks</i>	fears of injury to self or other, uncertainty psychological symptoms perceived effective use of social support	females > males females > males females > males
Lurie, Bar-Tal & Glick, 1995 <i>Israeli officers</i> <i>SCUD missile attacks</i>	perceived stress effective active behavioral coping effective social support seeking	females > males females = males females > males

Table 5, continued

Rahav & Ronen, 1994 <i>Israeli school children</i> <i>SCUD missile attacks</i>		
	behavior problems compared to prewar	females = males
Schwarzwald et al. 1994 <i>Israeli school children</i> <i>SCUD missile attacks</i>		
	measures of PTSD	females = males
Al-Issa & Ismail, 1994 <i>Kuwaiti university students after Persian Gulf War</i>		
	perception of social support	males > females
Hall & Jansen, 1995 <i>U.S. soldiers prior to deployment to Haiti</i>		
	sense of well-being	females = males
	physiologic arousal	females = males

(e.g., talking with others about the problem) and avoidance (e.g., tried to reduce tension by eating more), but the magnitude of these differences were small. Measures of coping, and the quality and quantity of social resources moderated the stressful effects of negative events in roughly equal proportions for women. For men measure of coping played a more significant role than social resources.

Kessler and McLeod (1984) analyzed pooled data from 5 major epidemiological studies investigating the exposure and vulnerability of men and women to stressful life events such as income loss, death of a loved one, divorce, loss of love, ill health, or a distressing event occurring to someone one in the respondent's social network (total pooled sample = 5309; men in labor force = 2221; women in labor force = 1616; women homemakers = 1472). They found considerable variability with regard to the type of loss that women or men were more prone to experience, depending on the type of distress. For example, men reported income loss much more frequently, and women reported network losses more frequently. Women experienced more psychological distress for network type losses, while men experienced more distress over income losses. Differential exposure played very little role in over effect in the contrast between men and women in the workforce, and worked to the advantage of women homemakers. Based on these results, the authors argued that women's greater propensity for caring and emotional involvement in the distress of other people in their network accounted for a substantial portion of research findings that suggest women are more vulnerable to stressful events.

Rosario, Shinn, Morch et al. (1988) investigated the relative merits of the socialization theory that states that women are taught early in life to use less effective coping strategies that adversely affects their habitual ways of viewing themselves and their relationship to others, versus role constraint theory which postulates that if women and men occupy similar roles the differences between their coping strategies will disappear. By studying measures of use of social support among male and female health professional working in similar positions, they found that men and women did not differ significantly on the methods and levels of coping with the stress of their jobs. Women reported they received significantly more levels of social support. Examining male and female child-care workers, they found that men reported using more emotion-focused coping, a result opposite to that expected from social role theory. In a study of university men and women they found no difference in coping by gender.

As previously discussed in the section on gender roles and the assignment of meaning to traumatic events, one view of sex differences in stress-coping is that men's lower level of emotional expression correlates with a poorer health outcome (O'Neil, 1981). It is important to consider that higher rates of reporting of emotions, distress, and symptoms among females, may reflect greater psychological health, rather than it being a reflection of increased vulnerability to trauma. Support for this idea comes from a study by Snell, Belk, and Hawkins (1986) who investigated a large group of university students. They found that among men who had experienced a large number of stressful life events, those with restrictive emotionality had higher levels of financial distress, and those with inhibited affection had higher levels of "love" distress.

Zerbe (1995) suggested that from an adaptive standpoint, women's heightened propensity to anxiety and anxiety disorders may reflect a trait selected through evolution because it conferred a high state of alertness. In prehistoric times women who were vigilant enough to protect themselves and their children in dangerous or exposed locations were more likely to survive long enough to pass on their genetic code.

Klingman and Kupermintz (1994) measured the interrelationships of coping responses, self control and state anxiety in 35 male and 58 female Israeli university students during the last week of the gulf war. The students were chosen from locations subjected to the heaviest SCUD missile attacks. Students' responses to the highly stressful situation of being locked in the sealed rooms during the attacks were assessed. Three types of coping strategies included emotional e.g. "I trembled," instrumental, e.g. "I tried to calm others," and blunting-like, e.g. "I thought of things not connected to the situation." Emotional and blunting-like responses were negatively correlated with each other. Respondents scoring higher on self-control had significantly higher instrumental and blunting like scores, and lower emotional scores. Females had more emotional responses than males. No significant interaction with other variables was observed for trait anxiety, a finding the authors related to the highly acute nature of the stressor which may have obscured the effect of this measure.

To examine the relationship between stress, coping abilities and gender, Bar-Tal, Lurie and Glick (1994) conducted a cross-sectional study of 150 male and 200 female Israeli enlisted soldiers during the six week Persian Gulf War in 1991. During this time,

Israel was subject to repeated SCUD missile attacks and the threat of chemical warfare. Both men and women were young unmarried adults of similar rank and similar duties with regard to the external threat of missile attacks. The female soldiers reported greater levels of stress as measured by responses endorsing feelings of uncertainty, or fears of injury to self or loved ones (female: $m = 2.92$; male $m = 2.71$). Females also reported a greater level of psychological symptoms such as trembling, nausea, sadness, sleep disorders, and rage. Female soldiers were more likely to perceive themselves as effective in seeking social support as a coping strategy. Male soldiers on average, were more likely to perceive themselves as effectively relying on avoidant measures such as sleeping more than usual, although the difference was only marginally significant. Paradoxically, the female soldiers who perceived themselves to be using social supports effectively, reported a higher level of stress than females reporting less effective use of social supports.

All subjects seemed to benefit from use of avoidant symptoms, with males greater than females in this regard. It is possible however, that the perception of effectiveness does not necessarily correlate with actual effectiveness, or that findings of higher measures of psychological distress in women reflect a greater willingness to report symptoms.

To differentiate the impact of stressful events in the development of PTSD, King et al. (1995) studied a subsample from the NVVRS that included 108 female and 300 male Vietnam theater veterans. They identified four groups of stressors from the NVVRS survey interviews, including exposure to traditional combat; exposure to atrocities, or mutilation; subjective perception of threat to one's safety; and exposure to the malevolent environment of a war zone consisting of day-to-day hassles, deprivations and overwork. Employing structural modeling to examine the causal path between these variables and the onset of PTSD, King et al. (1995) developed a model suggesting that traditional combat affects PTSD only indirectly through its influence on perceived threat. Male veterans scored higher on all measures of stressor than females, although the structural pattern was the same for both genders except that the path coefficient for the effect of traditional combat on perceived threat was greater for female than for male veterans. Exposure to atrocities had a direct effect on PTSD for both men and women. Exposure to a malevolent environment had a small indirect effect on PTSD by increasing perceived threat, but a greater direct effect on PTSD.

In summarizing studies of the effects of the 1991 Gulf War on the Israeli population, Milgram (1994) found that girls and women reported higher levels of war-related anxiety, fear, and somatic symptoms than boys and men. They also sought treatment more readily.

Rahav and Ronen (1994) studied 169 girls and 147 boys, all from the same primary school (second to sixth graders), in Tel-Aviv, Israel, after the Persian Gulf War missile attacks. By administering a questionnaire to the children, they measured the effects on these children of having spent their nights in sealed rooms during the preceding weeks when missiles struck an adjacent neighborhood. There was a significant increase in behavior problems that was unrelated to gender, compared to pre-war levels.

Schwarzwald, Weisenberg, Solomon et al. (1994) studied 492 Israeli school children one month, and again, one year after the SCUD missile attacks during the Persian Gulf War, using the Child Posttraumatic Stress Reaction Index (CPSR) and the Global Symptom Score (GSS). GSS at 1 month predicted 25% of the variance in gss at 1 year. Regression analysis showed that proximity to reported SCUD attacks interacting with female sex explained an additional 2% of the GSS variance at 1 year. Boys showed no greater change in GSS by region hit, while girls showed a significantly larger drop in symptoms in the region that was hit. Measures of PTSD showed no differences according to sex, and differences according to age only in the region that was hit by missiles. A significantly higher percentage of 5th graders with PTSD at 1 month (38.5%) continued to have symptoms at 1 year, whereas none of the older grades with initial PTSD retained symptoms at 1 year. Similarly, onset of delayed PTSD within 1 year was significantly greater in 5th graders (14.6%) than in older grades (2.5%).

Al-Issa and Ismail (1994) studied 30 male and 35 female Kuwaiti university students to determine the relationship between perceived social support and depression following the Persian Gulf War. In contrast to previous findings, the authors found that the Kuwaiti men had a greater overall perception of social support than Kuwaiti women.

Hall and Jansen (1995) studied 239 soldiers (72 women and 156 men) in the 10-day period prior to their deployment in Haiti in support of operation Uphold Democracy. There were no differences between male and female soldiers on the stress arousal checklist (sacl) that measures overall sense of well-being and levels of physiological arousal.

Social and Cultural Factors Influencing Risk and Course of PTSD

There has always been considerable resistance to acceptance and understanding of PTSD (Epstein, 1989; Epstein, 1994; Herman, 1992; Solomon, 1995a, 1995b). Part of this stems from the difficulty that health professionals and members of the community have in empathizing with the terrifying helplessness experienced by trauma victims. Social and psychological factors inhibiting acceptance of a victim's reality may be shaped by specific characteristics of the victims themselves, and by underlying cultural assumptions about those characteristics. For example, health care professionals who place great value on their own assertiveness, might have a hard time empathizing with a passive woman who returns to an abusive husband.

Solomon (1995a) described how Holocaust victims who arrived in Israel shortly after World War II were discouraged from discussing their ordeal because of the need of the established Israeli settlers to see themselves as invulnerable and detached from such experiences. Similar social and psychological factors operated in World War II and the Vietnam war (Solomon, 1995b). Milgram (1994) reviewed the literature on the reaction of Israeli citizens to the Persian Gulf War. The passive role that the armed forces and population played during that conflict led to it being the least discussed of Israel's wars. A population accustomed to active coping had adopted a strategy that required them to sit inside sealed rooms during SCUD missile attacks. For children in particular, this favored avoidant and distracting behavior.

Powell and Doan (1992) reviewed the literature on social support as it affects combat-related PTSD. Social support has been defined as the sense that one is cared for, esteemed, and feels a sense of belonging in a network characterized by shared communication and mutual obligations. Instrumental social support is the provision of resources such as employment or monetary compensation. A sense of social support has been found to facilitate healing from illness. Perceived social support is correlated with such factors as being married, having religious affiliations, education, or the attainment of social status. Powell and Doan (1992) measured attitudes towards reactions to fictionalized combat vignettes viewed in various combinations with low or high social support, in 48 women and 32 men who were university students. Social support was associated with lower anxiety scores and lower IES scores.

In her study of 50 female military nurses who served in Vietnam, Norman (1988) employed the IES to obtain retrospective measures of changes in their levels of symptomatology over the years, and to correlate current outcome with the amount of social support they experienced, both in Vietnam and after returning home. Although social support while stationed in Vietnam appeared to have some lasting modulating effect on IES scores reported for the post-Vietnam ratings, levels of social support after returning home played a more important role with regard to current intrusive and avoidant symptoms. As characterized by one nurse who refrained from speaking about the war for nine years, but who eventually developed contacts with women with whom she had formerly served:

"Those early years were so lonely. I kept the war hidden inside. I can finally talk about Vietnam to people who understand and people I trust."

Stretch, Vail, and Maloney (1985) found that for both current and past symptomatology, PTSD was greater in Vietnam nurses who had the most exposure to danger, and lower in those who experienced positive levels of social support during the war. These factors were equally important in accounting for symptomatology. Social support received upon return from the war explained more than half of the variance in current levels of PTSD. Conversely, hostile reactions upon return from the war were associated with a higher rate of current PTSD. Exposure to the stressful aftermath of battle appeared to have just as traumatic an effect as direct participation. Comparing overall rates of PTSD for these nurses with studies of veterans suggested that continued active military status confers a protective factors against PTSD.

Boscarino (1995) conducted a telephone interview study of 4462 male Vietnam veterans using the DIS as a diagnostic measure. Controlling for the effects of other variables current level of social support was inversely related diagnosis of PTSD, generalized anxiety disorder, depression, and alcoholism, suggesting that social support may play a protective role.

Overview and Directions for Future Research

The expanding involvement of women in the military challenges many long-standing assumptions about gender roles. Throughout history and in many cultures, women have played a part in military action, particularly in times of emergency. Often this has provided them with a sense of empowerment and active participation, sometimes forbidden to them during peacetime. This fact must be considered in understanding women's response to military stress. Encouraged by social progress and opening of opportunities previously denied to them, military women are now in a position to disprove long-standing gender stereotypes. The increased sense of active participation and empowerment experienced in serving the vital defense of one's country can be a powerful protective determinant in helping women to cope with stress. This means that studies on PTSD and other stress-related conditions in military populations must account for shifting social conditions. If accurate comparisons between male and female reactions to stress are to be obtained, changing factors related to social status, job satisfaction, morale, and level of authority, must be assessed and controlled for in multivariate analyses.

The effects of gender-related discrimination in the military must be factored into the study of PTSD. For example, the high prevalence of spousal abuse suffered by military women is a critical issue that requires better understanding. The effects of spousal abuse on the onset and chronicity of PTSD and other stress-related conditions in military women need to be quantified. The finding of Breslau and Davis (1992) that chronic PTSD is more prevalent in females, but that it does not have a higher co-morbidity with other anxiety or affective disorders, is an interesting one. It suggests that the effects of any genetic loading for the latter conditions may play a less important role in the development of PTSD than environmental, stress-related factors.

If spousal abuse and previous childhood abuse is related to gender-bias in the military, the mechanisms underlying this relationship need to be determined to develop effective corrective strategies. Historically, military organizations throughout the world have leaned toward a rigid patriarchal caste system that can be maladaptive for the health of its participants, and in the modern age at least, may be maladaptive for the military's mission as well. Reducing gender bias is likely to enhance the overall health of military personnel, and to foster improved organizational functioning by increasing esprit de corps and group cohesiveness.

Although the findings regarding sex-related differences in response to stress summarized in this chapter are complex, certain trends are apparent. Most direct comparisons show only small differences between males and females on clinical and psychological measures. Other variables, such as education, rank, socioeconomic status, and intelligence, appear to play a more important role than sex. That these social variables may differentially affect stress response in males and females provides a plausible explanation for the inconsistencies between the various studies.

For example, in the NVVRS (Kulka, Schlenger, Fairbank et al., 1990), women veterans evidenced lower rates of current and lifetime PTSD, and were slightly protected by their predispositional factors. The women veterans were generally, older, more educated,

of higher socioeconomic status, and held higher rank than the enlisted men with whom they were compared. In contrast, in the population of Persian Gulf War veterans surveyed by Wolfe, Brown and Kelly (1993), women showed higher rates of current PTSD than the men with whom they served. Unlike the female Vietnam veterans however, female Operation Desert Storm (ODS) veterans in the sample were generally of lower rank, less educated, and less likely to be married than male ODS veterans. Although combat exposures between the two studies are not comparable, the discrepancies in the findings still suggest that factors related to social role and authority play an important role in explaining the differences. The similarity in PTSD rates between female and male veterans of the Dutch Resistance (Hovens, Falger, Op den Velde et al., 1994) bolsters this argument, because of the comparable role that men and women played in many of the European resistance units during World War II.

Psychological studies showing sex differences on response measures such as emotionality, perceived coping skills, or acute psychological symptoms between males and females following a common trauma, do not offer much practical information unless "real world" measures of outcome such as occupational and social functioning are also obtained. Findings that suggest females experience more emotionality or acute psychological symptoms in response to stressful events do not provide sufficient information regarding the functional outcome. Do such gender-related findings relate to differences in adaptability, or to gender differences in reporting? Is increased emotionality and symptom-reporting consistent with mental health or with maladaptive functioning?

Prospective studies initiated proximal to stressful events, using measures of actual levels of work and social functioning, and employing multivariate analysis to control for potentially confounding variables, are required to determine whether early expression of distress and emotion correlate with level of adaptation. Multivariate analysis would also help to control for the effects of trauma type, degree of life threat and physical injury, psychological stage of development at which trauma occurs, and chronicity of post trauma symptomatology. Similar research designs are needed to determine the relationship of trauma to other disorders such as chronic pain, generalized anxiety disorder, obsessive-compulsive disorder, phobic disorder, and other mixed anxiety-depression syndromes. Intelligence is another factor that may correlate with social and adaptability variables, and that has been shown to explain a substantial portion of the variance for PTSD (McNally & Shin, 1995). It is important to ascertain the degree to which these other psychiatric conditions result directly from trauma itself, or reflect a secondary disability resulting from PTSD.

Another area deserving further investigation concerns individuals who do not meet full criteria for PTSD, but suffer from recurring intrusive or avoidant symptoms. Is "partial PTSD" qualitatively different than full PTSD? Is it a manifestation of a relapsing and remitting chronic condition? Are there gender differences in the extent to which either males or females suffer from partial PTSD?

We need further information about the relationship between PTSD and poor physical health. Studies showing increased risk for substance abuse, chronic pain, and other physical symptoms among PTSD patients indicate that much more needs to be

understood in this regard. Although the VES study (1989b) found comparatively few physical abnormalities in Vietnam veterans, they reported an increased level of physical complaints, suggesting a high level of psychological somatization.

To elucidate the relationship between trauma and the functioning of the hypothalamic-pituitary axis, biological studies of PTSD require a more systematic examination of populations of both males and females at various stages of the life cycle. Though expensive to conduct, neurophysiological and neuroradiological studies should control for potentially confounding variables such as socioeconomic status, substance abuse, and smoking (Epstein, 1990). Following the work of McNally and Shin (1995), prospective studies designed to gauge the effect of trauma on cognitive functioning are needed to ascertain whether low IQ comprises a risk factor for PTSD, and whether PTSD is associated with neurotoxic decrements in cognition.

A more complete understanding of the effects of stress are impossible without efforts to determine its meaning to each individual. A sense of helplessness, loss of the expectation of safety, violation of one's bodily integrity, battered self-esteem, devastation experienced when a life-long ideal has been shattered, profound feelings of being shamed, violation of one's sense of justice and equity--these are some of the core issues suffered by traumatized individuals. Future research must develop better ways of assessing these losses, thereby permitting stress to be defined more objectively.

Military service provides a means for men and women to play a vital role in defending the nation's security. Being involved in something that important furnishes a sense of pride and empowerment, and bolsters individual resilience to adversity. Anything detracting from this sense of personal meaning will impair self-esteem and vulnerability to stress. Given the self-perpetuating problems associated with gender bias in any organization, efforts to develop a deeper understanding and resolution of gender bias, will improve the health and morale of our military men and women, and strengthen their ability to pursue their important mission.

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**Posttraumatic Stress Disorder and Women in the Military:
Lessons From the National Vietnam Veterans Readjustment Study (NVVRS)**

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Introduction

In this chapter, we comment on the problem of exposure to trauma and the prevalence of posttraumatic stress disorder (PTSD) among women in the military. The broader literature on stress and its effects on the mental health of women in the military has been reviewed elsewhere (Epstein, this volume). Here we focus more specifically on exposure to traumatic stress ("extreme events"), its prevalence and sequelae.

Women in the Military

The number of women in the military has increased dramatically in recent years. In 1995, there were about 200,000 women on active duty in the U. S. military, representing about 14% of all active duty personnel. The proportion of incoming recruits who are women is even higher--19% in early 1994 (Adelsberger, 1994)--and it is expected that women will comprise 20% of the active duty force in the near future. The largest group of active duty women--approximately 70,000--are serving in the Army.

Some believe that women in the active duty military today are at greatly increased risk for stress because they have multiple characteristics that are associated with discrimination or other negative evaluation. For example, in addition to being women they are more likely than ever to be minority group members (Moore, 1991)--about 40% are classified as minority group members (53% in the Army). Also, they (and particularly African-American women) are the group most likely to be single parents: 13.3% of African-American female military personnel are single parents compared to 7.4% of white female personnel, 2% of Black male personnel, and 1.4% of white male personnel (Moore, 1991). Thus, women in the military may be subject to multiple life stressors to which their male counterparts are not subject, independent of those specifically related to service in the military.

In addition to serving in greater numbers, women now serve in a much broader array of positions than ever before. In 1987, all combat service support positions in the Army were opened to women, and in April 1993, the Secretary of Defense lifted the prohibitions against women flying combat aircraft. Although the Army still has a combat-exclusion policy that prohibits women from joining direct combat units in the armor, infantry, and cannon-artillery forces, it recently opened additional positions to women so that now approximately 67% of all positions in the Army are open to women (Adelsberger, 1994). This means that women in the military are now subject to many of the same military-related stressors to which men have been historically subjected.

Thus there are more women in the military today, and they are more likely to occupy positions that put them at risk for exposure to a broader array of stressors than ever. Given these trends, it is clear that to maintain readiness, we must improve our understanding of the impact of stressors on women in the military.

Issues in Stress Research

Over the past two decades, the relationship between exposure to a wide variety of stressors and outcomes including task performance, physical health, and mental health has been extensively examined. Although it is widely recognized that stressors are prevalent in our everyday lives and can never be fully avoided, researchers are particularly interested in understanding: (a) characteristics of individuals; (b) aspects of stressful events and conditions; and (c) other characteristics of the situation that result in either acute and/or long-term negative psychological and physical responses.

A number of conceptual definitions of "stress" have been proposed in the literature (Lazarus, Folkman, & Gruen, 1985; Baum, O'Keefe, & Davidson, 1990; Dohrenwend & ShROUT, 1981; Hobfoll, 1989; Seyle, 1976), yet the field continues to suffer from the lack of a clear operational definition of the construct (Davidson & Baum, 1993; Fletcher, 1991; Cheren, 1989; Bloom, 1985). Historically, stress research has focused on exposure to events or conditions (primarily noxious) and the outcomes that result from such exposure. Consequently, there has sometimes been confusion regarding the exactly what is meant by the term "stress": is it the stressor (exposure), or the person's biopsychosocial response to the stressor?

One important complication in studying the relationship between exposure to stressors and life outcomes is that the class of "stressful" exposures is very heterogeneous--i.e., there are many different kinds of stressful exposures. For example, stressful exposures include events that range from "stressful life events" (Holmes & Rahe, 1967) and "daily hassles" (Kanner, Coyne, Shaefer, & Lazarus, 1981) to "extreme (or traumatic) events" (APA, 1987).

Stressful life events include experiences that happen relatively infrequently to people but that may have important consequences for their lives. Examples of stressful life events include getting married or divorced, changing jobs, moving, having a birth or death in the family, etc. "Daily hassles," on the other hand, are the frequent but relatively ordinary stressors of everyday life, such as a long commute to work with heavy traffic or having to repeatedly redo certain tasks because of equipment failures. "Extreme events" are typically conceptualized as experiences that are "outside the range of usual human experience" that would be "markedly distressing to almost anyone." Some of the obvious and better studied extreme events are those associated with service in a war zone war (e.g., direct exposure to combat); others include physical and sexual assaults, serious accidents, natural disasters, etc.

It has been recognized that women experience numerous unique stressors associated with their gender and sex roles (Belle, 1982; Charney & Russell, 1994). As described in the report "Working Women's Health Concerns: A Gender at Risk," by the Bureau of National Affairs ("Stress tops," 1989), many leaders of national women's organizations suggest that stress is among the most serious hazards faced by women. Findings from a wide variety of studies suggest that women perceive a greater number and more severe stressors in their lives than men (Zappert & Weinstein, 1985; Fatkin, 1987; Karasek, Gardell, & Lindell, 1987; Beena & Poduvai, 1992). Furthermore, women also tend to have more negative outcomes from stress than men.

Some of this gender difference appears to be the result of more stressful work/home conflicts among women--women with and without children tend to report higher levels of stress than their male colleagues. Some of the other hypothesized reasons for gender differences include: value differences (e.g., women tend place higher value on non-work life than men while men's identity is more strongly tied to their work role); lack of "fit" between the woman and a male work environment, which may emphasize masculine-oriented behaviors and characteristics such as competitiveness; being devalued and having less support from male colleagues and supervisors because of their gender; and a greater willingness to admit feeling stress and endorse items asking about health and mental health problems.

PTSD and Women in the Military: Evidence from the NVVRS

Thus it seems clear that the kinds of stressors to which women in the military are likely to be exposed may differ substantially, both qualitatively and quantitatively, from the stressors to which men in the military are exposed. In addition, recent and continuing changes in the roles that women fulfill in the military are likely to increase both the prevalence of exposure to extreme events and other stressors and the types of extreme events to which they are exposed.

Because historically their roles have been limited to "noncombat" assignments, the prevalence of exposure to extreme events and its sequelae have not been well studied for women in the military. The most thorough examination of the psychological impact of war zone stressors on women in the military to date is the National Vietnam Veterans Readjustment Study (NVVRS), a multicomponent, nationally representative epidemiologic study of the prevalence of PTSD and other postwar readjustment problems among Vietnam veterans. Complete details of the NVVRS findings and methods are provided in Kulka et al., 1990a and 1990b. In the following sections we summarize the design of the NVVRS and the findings most relevant to the study of PTSD among women in the military.

NVVRS Methods

The NVVRS survey interview component involved face-to-face interviews averaging three to five hours in length with samples drawn to represent three major cohorts defined by extent of military involvement: (1) Vietnam theater veterans: men and women who served on active duty in the U.S. Armed Forces during the Vietnam era (August 5, 1964, through May 7, 1975) in Vietnam, Laos, Cambodia, or the waters or airspace surrounding these countries; (2) Vietnam era veterans: men and women who served on active duty in the U.S. Armed Forces during the Vietnam era, but did not serve in the Vietnam theater; and (3) nonveterans or civilian counterparts: men and women who did not serve in the military during the Vietnam era, matched to the theater veterans on the basis of age and sex, and on race/ethnicity (for men only) or military occupational specialty (for women only).

Because the roles (and therefore, it was expected, the in-country experiences) of men and women who served in Vietnam were quite different, each of the cohorts was separated by gender, yielding six major cohorts. Stratified random samples representing the veteran cohorts were selected from a frame consisting of the military personnel records of the more than 8.2 million living persons who had served on active military duty during the Vietnam era and had left the service as of September 30, 1984 (Veterans Administration, Office of Information Management and Statistics, 1984). Civilian counterparts were selected using nationally representative area probability household sampling techniques, in which sampled households were screened to identify persons who were eligible to have served in the military during the Vietnam era (e.g., were U.S. citizens of military-eligible age) but who did not.

The area probability sample of women civilian counterparts was augmented with a list sample of registered nurses to improve its comparability to the theater veteran group, because most women Vietnam veterans (about 85 percent) were nurses. These nurses were selected from a master list of almost 1.6 million registered nurses that was compiled from State nurse directories. This list included about 85 percent of the nation's registered nurses, based on Government estimates of the size of the U. S. nurse population. Undercoverage resulted from the fact that nurses in a few states were not fully enumerated because complete directories could not be obtained for these states.

The NVVRS survey interview was designed to cover the broad spectrum of adjustment, including such topics as: psychiatric disorder and nonspecific psychological distress; physical health; alcohol and drug use; marriage and family; education and occupation; military service and Vietnam experience; stressful and traumatic life experiences; and use of health and mental health services. A total of 3,016 household interviews (1632 theater veterans, 716 era veterans, and 668 nonveterans) were conducted by professional survey interviewers who had successfully completed a ten-day training session in administration of the interview. Response rates were over 83 percent for Vietnam theater veterans, 76 percent for Vietnam era veterans and 70 percent for civilian counterparts.

NVVRS Findings Concerning Stress Exposure and PTSD

The NVVRS was one of the first studies to document in detail the war zone experiences of women veterans. A multidimensional index of exposure to war zone stressors was developed that included measures of exposure to: wounded and dead; exposure to enemy fire; direct combat involvement; abusive violence; deprivation; and other potential stressors. Based on the multidimensional index, about 40% of the women were judged to have experienced high stressor exposure while in Vietnam (Kulka et al., 1990a).

NVVRS findings concerning PTSD prevalence indicate that 26 percent of the women who served in Vietnam had met the DSM-III-R criteria for PTSD at some time in their lives (Weiss et al., 1992), and that 8.5 percent were cases of PTSD at the time the study was conducted in 1987, many years after their service in Vietnam (Schlenger et al., 1992). Among those exposed to high levels of war zone stress, the current prevalence of

PTSD was even higher: 17.5 percent, versus 2.5 percent for those with low/moderate exposure. The current prevalence of PTSD among women era veterans and women civilian counterparts, formulated using the same methods as the estimates for theater veterans, was 1.1 percent and 0.3 percent, respectively.

In addition, the NVVRS team estimated the prevalence among women theater veterans of "partial PTSD," which was defined as the presence of clinically significant PTSD symptoms that did not meet the full diagnostic criteria (Weiss et al., 1992). A common example of the partial PTSD syndrome was veterans who met the DSM-III-R A criterion (exposure to trauma), B criterion (reexperiencing symptoms), and D criterion (hyperarousal) for PTSD but not the C criterion (numbing/avoidance), and who used alcohol or drugs in ways clearly linked to their PTSD symptoms. NVVRS findings indicated that 21.2 percent of women Vietnam veterans had suffered from partial PTSD at some time in their lives, and that 7.8 percent had partial PTSD at the time they were interviewed.

The NVVRS also examined the issue of psychiatric comorbidity--i.e., what other psychiatric disorders tend to co-occur with PTSD? Women Vietnam veterans with current PTSD were found to be much more likely to meet criteria for a variety of other psychiatric disorders than those without PTSD. Overall, the most common comorbid psychiatric disorders for women Vietnam veterans were major depression, generalized anxiety disorder, and alcohol abuse or dependence (Jordan et al., 1991).

Clues from the NVVRS Concerning PTSD Etiology

Thus the descriptive NVVRS findings show that the prevalence of PTSD is much higher among women Vietnam theater veterans than among era veterans or civilian counterparts, and that within the theater veteran group the prevalence is much higher among those with high war zone stress exposure than those with low/moderate exposure. These findings suggest that war zone stress exposure may play an important role in the development of PTSD among those who serve in a war zone.

It is also possible, however, that preexposure differences between the cohorts in psychosocial or other background characteristics accounts for the observed differences in PTSD prevalence, rather than differences in exposure levels. That is, since military personnel were not assigned to Vietnam service at random, it is possible that the processes through which decisions were made concerning which personnel would serve in Vietnam introduced (unintentionally) biases that rendered the troops who served more vulnerable to the development of PTSD than those who did not.

To examine this question, multivariate analyses were undertaken to assess the contribution of a variety of background factors and stressor exposure to the prevalence of current PTSD (Schlenger et al., 1992). Background variables studied ranged from a variety of indices indicating the circumstances under which the veteran grew up (e.g., socioeconomic status of the veteran's family of origin) to the presence of a variety of life disruptions during the veteran's childhood to the presence of specific psychiatric disorders prior to Vietnam service.

Findings of the multivariate analyses for women indicated that the single strongest factor related to PTSD was war zone stressor exposure, and that adjusting for a wide variety of "potential predisposing factors" had little impact on the differences in PTSD prevalence rates between women theater veterans and the comparison groups (era veterans or civilian counterparts). Consequently, although findings for both men and women indicated that certain background factors are important in determining who among those exposed to war zone stress ultimately develops PTSD, exposure itself is the single most important factor.

Discussion

The NVVRS data have both strengths and weaknesses with respect to improving our understanding of exposure to extreme events and PTSD among women in the military. The external validity (generalizability of the findings to the population of women Vietnam veterans) of findings from the NVVRS about women Vietnam veterans is very high because the sample is a true probability sample of the population of women who served in Vietnam. The internal validity of the comparisons of PTSD prevalence rates between theater veterans and the comparison groups is also high, given the use of probability samples and of multiple measures for estimating the prevalence of PTSD. As a result, the NVVRS estimates of the prevalence of war zone stress exposure and of PTSD are unbiased by sampling or other methodological problems.

An important limitation of these findings with respect to their application to today's military, however, arises from the fact that women's roles in the military have changed dramatically since the Vietnam war. About 85 percent of the women who served in Vietnam were nurses, and they served mostly as health care providers or administrators. In addition, they were virtually all white, and most were college graduates and officers. These characteristics resulted in a substantial homogeneity of background and experience that do not reflect well the diversity of backgrounds and experiences of women in the military today. In fact, NVVRS findings (Kulka et al., 1990b) show clearly that the women who served in Vietnam were a highly selective subset of the women in the military at the time of the Vietnam war as well--that is, they were very different from women in the military at the time who did not serve in Vietnam.

So what is the value of the NVVRS findings about women Vietnam veterans for today's military? Although their applicability to the diverse range of women in the military today is limited, it remains that the kinds of roles that women played in Vietnam are important roles in any military action, and will continue to be filled by women (though maybe less universally) in the future. Consequently, the specific findings are best thought of as applying to that subset of women who occupy similar positions in today's military--health care workers dealing with the physical wounds of war.

More broadly, however, NVVRS findings about the roles of "predisposing" characteristics and war zone stressor exposure have advanced our understanding of the etiologic factors underlying PTSD. The broad range of findings are consistent with a model that includes roles for both preexposure characteristics of the person and the nature

of the exposure itself in determining who develops PTSD. This suggests that interventions aimed at reducing exposure to extreme events, and at selecting persons carefully for assignments in which the likelihood of exposure is increased, are likely to reduce the long term psychosocial sequelae of service in a war zone.

Thus it is clear that much has still to be learned about stressors of women in the military. Although the impacts of stressors on military women have been found to be similar to the stressors of other women, and although negative outcomes related to stress appear to be similar for both populations, the information currently available is insufficient to develop effective intervention and prevention programs.

First, we need more definitive information about stressors and outcomes on a broader sample of women in the military. Previous studies have been focused particularly on nurses and other small groups, such as military police units. These data do not represent the wide variety of occupations of military women today.

Second, we need more detailed information on the stressors to which women in the military are exposed. What are the stressors experienced by women in various military roles, and what is their impact on job performance, health, and other relevant dimensions? What are the specific factors that make their roles stressful and why are they less stressful in some units than in others?

Third, we need more information about the relative importance of different types of stressors and how stressors relate to sociodemographic and other characteristics. Prevention and intervention programs can then be targeted for particular groups of women. For example, the most serious stressors for unmarried junior enlisted personnel may be different than those for older married women officers. The most important stressors of nurses are likely to be different from the most important stressors of combat support personnel.

Fourth, and similarly, we need to understand better the factors that mediate stressors. For example, how does social support influence whether a particular type of stressor impacts negatively one woman and not another with similar demographic characteristics? What organizational structures and programs might be changed or developed to help women in the military access and use buffers such as social support more effectively? The answers to these and other questions will contribute substantially to the ability of the military to maintain a high level of readiness among its increasingly diverse personnel.

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Lessons From the NVVRS

**Sex Differences In Alcohol and Drug Use:
Is There Evidence For Stress Mediation?**

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Introduction

In the civilian population, there are clear sex differences in the prevalence of alcohol, nicotine, and illicit drug use. In general, women report using alcohol, tobacco, opiates, psychostimulants, and hallucinogens less frequently and in lesser quantities than men (U.S. Department of Health and Human Services [USDHHS], 1993). In contrast, women between the ages of 18 and 45 report more use of sedatives and tranquilizers than men in the same age group (Gomberg, 1993). Similarly, during the month preceding the 1992 National Household Survey on Drug Abuse, more than 1.3 million women, slightly more than the number of men, had taken prescription drugs for nonmedical purposes (USDHHS, 1993). Sex differences in substance use are evident in the military population as well, although the pattern of differences does not consistently mirror that in the civilian population (Bray et al., 1992; Bray, Fairbank, & Marsden, this volume). Because of the lack of studies that include women, it is difficult to assess the validity of alternative hypotheses to explain sex differences in alcohol and drug use.

Stress is thought to be one factor that contributes to the use and abuse of alcohol and other drugs (O'Doherty, 1991), and a large empirical literature addresses the relationship between stress and substance use. There is a growing literature on sex differences in the potency of stressors (e.g., Brown & Grunberg, 1995; Matthews, Davis, Stoney, Owens, & Caggiula, 1991), in stress reactivity (e.g., Allen, Stoney, Owens, & Matthews, 1993; Light, Turner, Hinderliter, & Sherwood, 1993; Polefrone & Manuck, 1987), and in strategies for coping with stress (e.g., Gadzella, Ginther, Tomcala, & Bryant, 1991). Moreover, the effect of menstrually-related hormonal variation on stress reactivity has begun to be studied (e.g., Girdler & Light, 1994; Polefrone & Manuck, 1988; Stoney, Owens, Matthews, Davis, & Caggiula, 1990). Thus, among the many potential sources of sex differences in alcohol and other drug use are sex differences related to the experience of and response to stress. Only recently has this possibility begun to be explored (e.g., Baum & Grunberg, 1991).

It is well-documented that military personnel are exposed to a variety of stressors. Some of these stressors comprise extreme environments such as exposure to mutilation (e.g., McCarroll, this volume). Other stressors, including those imposed by dual-career marriages, which are also commonly experienced by the civilian population, may have unique implications for military personnel (e.g., Scarville, Steinberg, & Harris, this volume). Investigations of the role of stress in drug use, therefore, may be of particular relevance to the military population and to subsets of military personnel exposed to particularly intense stress, and may contribute to an understanding of sex differences in substance use among military personnel. Studies of military women and men, in fact, may provide a unique opportunity to examine potential sexual dimorphism in the effects of stress on drug use (e.g., Bray, Fairbank, & Marsden, this volume), as well as its effects on response to alcohol and drug challenge. The primary purpose of this chapter will be to consider evidence that, to some extent, stress may mediate these sex differences, and to propose ways in which this possibility might be explored empirically.

Significance of the Problem

Sex differences in the pattern of use and abuse of alcohol and other drugs have long been recognized (Wall, 1937). In the past 25 years, the application of increasingly sophisticated epidemiological methods to the study of substance use and abuse has confirmed this impression (Substance Abuse and Mental Health Services Administration, 1995). Preliminary consideration of the epidemiological data might suggest that concern about alcohol and drug abuse in military women is unfounded, or that application of resources to the amelioration of substance-related problems in women is unwarranted. The utilitarian logic described by Holloway (this volume) suggests, however, that actions should be dictated not only by the prevalence of a problem, but by its implications for military readiness and effectiveness. Whereas epidemiological data render useful information in defining a problem, the larger question of ramifications must be considered. It is important to consider not only the prevalence of drug abuse among military women, but also the acute and chronic effects of the abuse on those women and, consequently, on readiness. Although civilian and military women report less use of alcohol and some other drugs than their male counterparts, an examination of the extent and effects of that use suggests that it may diminish the effectiveness with which military women as well as men accomplish their mission responsibilities.

Based on the prevalence statistics provided in the 1995 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel, for example, 5.3% of military women reported heavy alcohol use in the 30 days preceding the survey (R. M. Bray, personal communication, 03-11-96). Estimating the number of military women reporting heavy alcohol use from this sample statistic, over 10,000 military women were drinking heavily in the month preceding the 1995 survey. Although substantially fewer than the number of men reporting heavy drinking, the impact on readiness of alcohol drinking among military women is potentially significant.

Moreover, patterns of alcohol and other drug use are changing; the magnitude and direction of change depends upon class of drug and on demographic group. Although reports of converging rates of female and male substance abuse are somewhat inconsistent, there is evidence of an increase in the use of some drugs by women (Gomberg, 1993). Though the reasons for this are not completely understood, it has been suggested that this increase in drug use reflects changes in women's role in society (Colton & Marsh, 1984). As changes in women's role in the military are paralleling, or even preceding, those in civilian society, this is an important consideration.

The overriding predictor of alcohol and drug problems is the extent of alcohol and drug use (Robbins, 1989). That is, above all, sex differences in self-reported problems resulting from alcohol and drug use are due to differences in the frequency of intake and intoxication. Given use of alcohol and other drugs, women appear to be equally at risk for experiencing problems as a result of their substance use, although the nature of those problems may differ from those experienced by men (Gomberg, 1993). It is notable that in the Epidemiological Catchment Area study, for example, substance abuse was the second most commonly reported mental health disorder for women between the ages of 18 and 24 (Eaton et al., 1984). Other studies have found that, among civilian women, substance

abuse is second only to depression as the primary diagnosis of women seeking mental health support services (Mendelson & Mello, 1986). The effects of alcohol and other drugs on general physical health have been well-documented (e.g., Galanter, 1985), and it is generally agreed that women may be more vulnerable to these detrimental effects than are men (Hill, 1995).

Further underscoring the potential significance of the problem, results of the National Institute on Drug Abuse (NIDA) National Pregnancy and Health Survey reveal that 18.8% of civilian women used alcohol at some time during pregnancy, and 20.4% smoked cigarettes while pregnant (Leshner, 1994). Comparable data for drug use among pregnant military women are not yet available.¹ Among military women, nearly 80% of whom are between the ages of 21 and 40 (Institute of Medicine [IOM], 1995), this consideration is particularly relevant. There has been a strong focus in the last decade on the effects of maternal alcohol and drug use on fetal development. In addition to Fetal Alcohol Syndrome, which is widely recognized and well-studied (e.g., Jones, Smith, Clelland, & Streissguth, 1973), more subtle outcomes, including symptoms of attention deficit disorder, recently have been attributed to alcohol and drug use during pregnancy (Streissguth et al., 1986). Developmental outcomes such as these may increase stress on women and their families.

Also relevant to reproductive health, the potential effects of alcohol and drug use on the menstrual cycle have begun to be considered in the scientific literature (e.g., Gavalier, 1995), as have the effects of menstrually-related hormonal fluctuations on drug intake and acute drug effects (e.g., Mello, 1986). Although seasonal cyclic variation in the androgens in men is known to occur (e.g., Levine, 1994), there are no empirical data bearing on the effects of drugs of abuse on those hormonal fluctuations. Similarly, the effects on drug intake of hormonal fluctuations in men have not been investigated.

Psychoactive drugs are known to have effects on cognition and performance (e.g., Hannon et al., 1985). There is a small body of research which suggests that those effects are different for women and men (e.g., Martin et al., 1985; Niaura, Nathan, Frankenstein, Shapiro, & Brick, 1987; Palva, 1985). The magnitude and direction of these sex differences depend upon the drug, the timing of assessment, and the domain of measurement. Pharmacokinetic factors appear to mediate some, but not all of the sex differences in drug effects, suggesting there are sex differences in neural sensitivity to drugs. These differences in sensitivity appear to be genetically-mediated in part (Martin et al., 1985). Because there has been a failure to include women in studies of response to alcohol and drug challenge, neither the extent of these sex differences, nor the factors that mediate them, are clearly understood. The existing research suggests, however, that the effects of drugs on performance of military assignments may differ for women and men.

¹The 1995 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel contained a question regarding the use of alcohol and other drugs during pregnancy. Analysis of the 1995 survey is in progress (R. M. Bray, personal communication, 01-15-96).

Thus, although military women report less use of alcohol and other drugs than military men, a significant number of military women report heavy use of alcohol and tobacco. That substance use may affect the health and performance of military women in a myriad of ways, ranging from effects on reproductive health to effects on performance of military assignments. Given the paucity of alcohol and drug studies that include women, however, the consequences of their substance use are difficult to assess.

Etiology of Substance Abuse

As with the *consequences* of psychoactive substance use, what we now know about the *antecedents* of substance abuse is based almost exclusively on studies of men. Despite tremendous strides made in the last two decades in understanding the etiology of substance use and abuse (see Galanter, 1993, for a review), we lack an adequate and comprehensive explanation of the lower prevalence of alcohol and other drug use and abuse among women (Hill, 1995). Hypotheses have been proposed to explain sex differences in alcohol and drug use; these hypotheses have incorporated genetic, physiological, psychological, psychosocial, as well as cultural factors (e.g., Galanter, 1995); however, a lack of empirical data collected from women prohibits systematic assessment of the validity of those hypotheses. Elucidation of sex differences in the etiology of substance abuse may contribute to more effective, perhaps sex-specific, detection, prevention, and intervention strategies. A better understanding, therefore, of the etiology of substance-related problems in women may contribute to an increase in the effectiveness of military women.

Multifactorial Model

In a multifactorial model (Falconer, 1960), there is considered to be an underlying dimension of vulnerability to a disorder. The total liability of an individual will be the result of his or her "score" on a number of factors that increase or decrease vulnerability. The distribution of liabilities in a population is considered to be roughly normal. This model leads to a view of individual differences in strengths and vulnerabilities; some individuals will be particularly vulnerable, others will be particularly resilient, and the liability of most individuals will be within one or two standard deviations of the mean liability. Individuals whose liability exceeds a threshold will be affected with the disorder (i.e., will meet diagnostic criteria). This model, therefore, provides for an underlying, continuous distribution of liability, as well as accommodating traits and disorders that are noncontinuous. The task becomes the identification of genetic factors that modulate vulnerability and resilience, as well as the definition of aspects of the environment most likely to challenge the resilience of individuals. This approach has been employed very fruitfully for over two decades in the study of mental health and psychopathology.

"In general, the transmission of alcoholism [or that of other substance abuse disorders] does not conform to simple Mendelian principles... [Rather,] a multifactorial mode of transmission, consisting of both environmental factors and the influence of many genes individually exerting small effects, [provides] a better fit to the data" (Stone & Gottesman, 1993, p. 126). A multifactorial model of genetic and environmental causation

of alcohol and substance abuse discourages a search for single genes, or even for single environmental factors that will identify alcoholics or substance abusers. Instead, this model encourages the identification of multiple genetic and environmental factors that affect vulnerability to substance abuse through small effects on liability (e.g., Devor, 1993; McGue, 1988; Stone & Gottesman, 1993).

The widely acknowledged increase in opiate use and addiction among military stationed in Vietnam during the Vietnam era can be considered in terms of a multifactorial model. From all U.S. Army enlistees leaving Vietnam in September, 1971, a random sample of enlistees was selected (Robins, Helzer, & Davis, 1975). Before arrival in Southeast Asia, hard drug use was very unusual among the enlistees, and less than 1% of the sample had ever been addicted to narcotics. In Vietnam, nearly half the sample tried narcotics and 20% reported opiate addiction. The prevalence of opiate use was much higher than would be expected, based on a comparison with a demographically similar population of civilians in the United States. This suggests that environmental characteristics of the Vietnam theater, most notably the availability of "inexpensive and relatively pure narcotics in a situation devoid of the direct influence of a disapproving family" (Robins, Helzer, & Davies, 1975, p. 961), coupled with the boredom and other stressors experienced by military personnel stationed there, served to increase the liability of these individuals. For many military personnel, this increase in liability served to bring them over the threshold for abuse and dependence. Moreover, consistent with this interpretation of the high prevalence of opiate use, after returning to the United States, usage and addiction decreased to prewar levels.² Thus, a greater proportion of these addicts were rehabilitated upon return to the United States than would be expected, based on the likelihood of rehabilitation among heroin addicts in the United States. Because the increase in heroin use was due to the effects of transient environmental factors, rather than to the effects of a genetic diathesis, or to chronic environmental influences, the removal of those factors decreased the liabilities of many military personnel to levels below the threshold for abuse and dependence.

Thus, the multifactorial model leads to a focus on individual differences in liability and to an examination of the genetic and environmental factors that underlie those differences.

Sex Differences in Etiology?

Group differences in the prevalence of a disorder, such as sex differences in the prevalence of alcoholism, may result from *homogeneous* or *heterogeneous* factor structures (Rowe, Vazsonyi, & Flannery, 1994). For example, the factors underlying alcohol abuse in women may be the *same* as those in men; in this case, sex differences in prevalence would arise from a situation in which women receive a "lower dose" of one or more of the factors that increase liability. For example, a "macho" subculture that implicitly promotes

²There is some controversy over the extent of conversion to alcohol use among these veterans upon returning to the United States (Goodwin, Davis, & Robins, 1975).

drinking among young men may not be imposed upon women to the same extent--they may receive a "lower dose" of the cultural pressures to drink excessively. Alternatively, group differences may result from heterogeneity in the factor structure underlying the disorder. That is, *different* factors may lead to the use and abuse of alcohol and other drugs in women than in men. As will be described in the following section, for example, it has been hypothesized that genetic factors do not play as important a role in the development of alcoholism and substance abuse disorders in women as in men (e.g., McGue, Pickens, & Svikis, 1992).

Whereas genetic methods offer powerful tools in the elucidation of phenotypic sex differences (McClearn, 1995), only rarely have these methods been fully exploited (e.g., Cloninger, Christiansen, Reich et al., 1978). Thus, there is not yet an adequate genetic model to account for the observed sex differences in the use or abuse of alcohol, nicotine, or other drugs of abuse. There are, however, data bearing on the heritability of alcohol and substance abuse disorders in women.

Genetic Studies of Alcohol and Substance Abuse

In recent years, a great deal of attention has been focused on the genetic bases of alcohol and other drug abuse. Alcohol (Cotton, 1979) and other substance abuse disorders (Rounsaville, 1988) cluster within families. Twin and adoption studies, which provide means of disentangling genetic from environmental contributors to this familiarity, suggest that there are genetic influences on vulnerability to some forms of alcohol and other substance abuse disorders (see Goldman, 1993, for a review). It is important to emphasize that the same research points to the importance of the environment in the etiology of alcoholism and substance abuse (McGue, 1988). The mechanisms of genetic and environmental influence remain unknown, as do the ways in which genetic and environmental factors interact in the development of substance abuse (e.g., Gottesman, 1988; Stone & Gottesman, 1993).

Adoption studies. Because conventional family studies focus on groups of individuals who share not only a genetic heritage but also a common environment, it is not possible to disentangle from these studies the role of genetic and environmental factors in accounting for this familiarity. Adoption studies provide estimates of genetic influence by studying adopted-apart relatives, typically biological parents and their adopted-away offspring, separated early in life. Adoption studies also provide estimates of shared environmental influence by studying genetically unrelated individuals adopted together, such as adoptive parents and their adoptive children. Issues in the analysis of adoption data are described further by Plomin, DeFries, & McClearn (1990).

The first evidence for the role of genetic factors in the etiology of alcoholism in women comes from early studies of adopted-away children of alcoholics (Travis, 1988). Bohman, Sigvardsson, and Cloninger (1981) found alcohol abuse to be three times more prevalent in the adopted-away daughters of alcohol-abusing mothers than in adopted-away daughters of nonalcohol-abusing mothers. If only the biological father abused alcohol, the increased alcohol abuse in daughters was insignificant. Similarly, alcohol abuse in both

biological parents did not increase the risk to adopted-away daughters over that predicted by alcohol abuse solely in the mother. Moreover, women whose biological mother, as well as an adoptive parent, were alcohol dependent did not show an increased prevalence of alcoholism over the group with only an alcoholic biological mother. The latter finding suggests that, for women, factors associated with being raised by an alcoholic parent do not increase vulnerability over the genetic risk associated with having a biological parent who is alcoholic. This finding is consistent with an earlier study of adopted-away male offspring of alcoholics (Goodwin, Schulsinger, & Hermansen, 1973). In another study, daughters of alcoholic biological fathers who were adopted away were compared with those who remained with their fathers (Goodwin, Schulsinger, Knop, Mednick, & Guze, 1977). The rate of alcoholism was found to be four times greater in both of these groups than in the general population. Moreover, this rate did not differ from that found in women, adopted-away at birth, whose biological fathers had not used alcohol excessively, which suggests that factors associated with adoption per se may increase the risk of alcohol abuse in women. The relative importance of having an alcoholic biological mother or father, of having an alcoholic adoptive parent, and of being adopted, in predicting alcoholism in women remains unclear. Accordingly, conclusions regarding the relative contributions of genetic and environmental factors in the development of alcoholism in women are difficult to draw on the basis of existing adoption studies.

Twin studies. A second means of distinguishing the role of genetic and environmental factors in accounting for the familiarity of a trait or disorder is provided by the twin study method. This method exploits the existence of two types of twins, monozygotic (MZ), or identical twins, who arise from a single fertilized egg, and dizygotic (DZ), or fraternal twins, who arise from two separately fertilized eggs. MZ twins are genetically identical, whereas DZ twins are 50% similar genetically, on the average. By comparing the phenotypic similarity of MZ and DZ twins, it is possible to estimate the relative contributions of genetic and environmental factors to trait similarities and differences. Whereas there is a twofold difference in genetic similarity between the two types of twins (100% vs. 50%), both types of twins share roughly the same environmental influences. If MZ twins are found to be no more similar than DZ twins for a particular trait, then genetic factors cannot contribute to variance in that trait. That is, if the twofold greater genetic similarity does not make cotwins more similar phenotypically, then genetic factors cannot be important in accounting for similarities and differences. If, on the other hand, MZ twins are significantly more similar than DZ twins for a trait, then that trait is considered to be influenced by genetic factors. The twin method has proven useful in distinguishing the contributions of genes and the environment to individual differences in personality (see Henderson, 1982, for a review), psychopathology (see Gottesman & Shields, 1976, for a review), and IQ (see Bouchard & McGue, 1981, for a review). Of particular relevance to military issues, the twin method has been used effectively to examine genetic and environmental contributions to posttraumatic stress symptoms in Vietnam era veterans (True et al., 1993), as well as to study genetic influences on exposure to trauma in combat (Lyons et al., 1993). A detailed examination of the twin method, including details of the biology of twinning, the underlying assumptions of the twin method, and the analysis of twin data, is provided by Plomin, DeFries, & McClearn (1990).

In a study of female twins ascertained from a population-based registry, Kendler, Heath, Neale, Kessler, & Eaves (1992) found that concordance for alcoholism was consistently higher in MZ than in DZ twin pairs. This was the case using narrow and intermediate, as well as broader definitions of alcoholism. Using these twin data, multifactorial threshold models suggested that the heritability of liability to alcoholism in women was in the range of .50 - .60. That is, in women, 50 - 60% of the variance in vulnerability to alcoholism can be accounted for by genetic differences among women. This finding is consistent with some twin studies of alcoholism in males (e.g., Kaij, 1960), and with the hypothesis that genetic factors play a major role in the etiology of alcoholism. By contrast, in a sample of twins ascertained through treatment centers, statistically significant differences in concordance (i.e., MZ>DZ) were found for composite DSM-III diagnoses of Alcohol Abuse and/or Dependence in male, but not female, twins (Pickens et al., 1991). The same pattern was observed for composite DSM-III diagnoses of Substance Abuse and/or Dependence. Specifically, estimates of heritability were .35 for males and .24 for females (i.e., genetic factors were found to account for only 24% of the variance in vulnerability to alcoholism in women). On the basis of these data, McGue, Pickens, and Svikis (1992) have suggested that genetic factors may be less important in the etiology of alcoholism in women than they are in men; other studies are not consistent with this interpretation (e.g., Heath, 1995; Kendler, 1992). A review of the pertinent studies, in fact reveals inconsistencies with regard to sex differences in the heritability of alcohol and other substance abuse disorders.

Thus, conclusions regarding the importance of genetic factors in vulnerability to alcoholism, as well as those regarding the magnitude of the sex difference in heritability, vary across studies. These differences may be attributable to differences in the characteristics of the study samples, to differences in the definitions of alcoholism used by investigators, or to differences in the analytic techniques employed (Heath, 1995). Considering the findings of adoption and twin studies, it is clear that confirmatory studies are needed to establish the importance of genetic factors in alcohol and other drug abuse in women (Travis, 1988).

It is notable in this context that the Department of Defense maintains a twin registry of male Vietnam era twins (Henderson et al., 1990), whereas there is no comparable registry of female twins. In 1995, there were 194,000 women serving in the armed forces (IOM, 1995); in the United States, one in 83 deliveries is a twin birth (Plomin, DeFries, & McClearn, 1990). One might expect, therefore, that over 2,000 women in the armed forces are members of a twin pair. The establishment of a registry of female twins serving in the U.S. military would provide an invaluable resource that could be employed to investigate further the etiology of alcohol and substance abuse in women, as well as other questions bearing on the health and performance of military women.

Stress and Substance Use

The multifactorial model provides a conceptual framework for investigating genetic and environmental contributors to alcohol and substance abuse. Whereas the magnitude of the genetic contribution to the development of alcoholism and substance abuse in women

remains to be unequivocally established, and the particular genes involved are not yet identified, it is clear that environmental factors are of great importance in the development of substance abuse in women as well as men. The goal of etiologic research has become the identification of those environmental factors, as well as an understanding of the ways in which genetic influences are modulated by the hormonal, psychosocial, and cultural environment in which they operate. Considering stress-related influences on substance use within the context of the multifactorial model provides for an examination of genetic and environmental influences at all of these levels, as well as interactions among them.

From this perspective, exposure and reactivity to stress may be viewed as components of an overall liability to alcohol or drug use. Variation in behavioral and autonomic measures of stress reactivity has been found to be genetically influenced in animals (e.g., Blizard, 1988) as well as humans (e.g., Carmelli, Chesney, Ward, & Rosenman, 1985; Rose, Grim, & Miller, 1984). Moreover, it has been reported that there is heritable variation in the tendency for stress to increase risk of psychopathology (Kendler, 1995). That is, genotype may mediate sensitivity to the disease-producing effects of stressful environments (K. S. Kendler, personal communication, 03-14-95).

Also remarkable are recent findings that there is a genetic contribution to the tendency to be exposed to stress. Helzer, Robins, and McEvoy (1987) argued that there is a predisposition that affects not only reaction to trauma, but the likelihood that one will be exposed to trauma. Consistent with such a predisposition, Lyons et al. (1993) reported heritability estimates of 35 - 47% for self-reported combat experiences, based on a twin study of combat experience in Vietnam veterans.

Sex differences in stress. Despite changes in the roles of women and men in society, there continue to be differences in the extent to which women and men are exposed to a variety of stressors. For example, physical and sexual assault in adulthood, as well as childhood victimization, which are not experienced with equal frequency by women and men, have been found to increase the risk to women of abusing alcohol and other drugs (Wilsnack & Wilsnack, 1995). Moreover, there may be sex differences in the stress-inducing potency of the same environmental conditions. In a study of the effects of housing on male and female rats, Brown & Grunberg (1995) found that crowding stresses male but not female rats.

There is also a literature to suggest that women and men react differently to stress. Males show exaggerated response to stress on some but not all of the neuroendocrine and cardiovascular measures employed in these studies (Polefrone & Manuck, 1987). These studies have grown out of a focus on sex differences in the prevalence of cardiovascular disease; the implications of differences in stress reactivity to other indices of physical and psychological and well-being, including substance use, are not clear.

Finally, the literature on sex differences in coping, though somewhat inconsistent, suggests women and men employ different coping strategies (e.g., Gadzella, Ginther, Tomcala, & Bryant, 1991). As reflected in other volumes in this series, anecdotal evidence of sex differences in coping with stress emerged from discussions with military personnel during the conduct of this project (e.g., Ursano, 1995); empirical evidence of such

differences was provided by the 1995 Worldwide Survey on Substance Abuse and Health Behaviors Among Military Personnel (Bray, Fairbank, & Marsden, this volume).

Drug use and stressful life events. There is a large and often-cited literature on the relationship of life events to substance use and abuse. This literature has been reviewed elsewhere (e.g., O'Doherty & Davies, 1987; Travis, 1988), and will not be considered at length in this chapter. Although there are issues in the interpretation of this research, including questions about the direction of causality (Allan & Cooke, 1985), there is some evidence that stressful life events may precipitate substance abuse.

It has been noted that the approach to the study of life events and substance use generally has been atheoretical (O'Doherty, 1991). As already described, quantitative genetic theory provides a framework within which this relationship can be studied. From this perspective, exposure to stress and stress reactivity may be considered as contributors to an overall liability or resilience. The tension reduction hypothesis, together with an approach to drug self-administration based on reinforcement theory, extends this framework and incorporates a large body of empirical and theoretical work.

Tension Reduction Hypothesis

The notion that psychoactive substances may be used to reduce stress is widely accepted by the lay population. In the past 50 years, the relationship between alcohol use and stress has received a great deal of empirical attention (Levenson, Sher, Grossman, Newman, & Newlin, 1980). The most long-standing reflection of this attention is the "tension reduction hypothesis" (Conger, 1951, 1956). According to this proposal, when alcohol is consumed during a "high drive state" (e.g., tension), the response of alcohol consumption is reinforced by virtue of its ability to reduce that drive state. Whereas this model has generated much controversy (e.g., Cappell & Herman, 1972), and its application in experimental settings has been questioned (Levenson et al., 1980), these discussions are beyond the scope of this chapter. The model, nevertheless, provides a useful vantage point from which to view the scientific literature on stress and substance use.

Questions derived from the tension reduction hypothesis may be tested in the laboratory. First, one may examine, in animal or human subjects, the effects of stress on alcohol or drug intake. When an organism is exposed to stress, does the organism increase its intake of psychoactive substances? The effects of acute or chronic stress, as well as those of stress that is proximal or distal to the opportunity to self-administer drugs, may be examined. Alternatively, one may consider stress reactivity as a trait, and ask whether individual differences in that trait are associated with variation in alcohol- or drug consumption. Specifically, are organisms that are characterized by high levels of stress reactivity more likely than "low reactors" to consume psychoactive substances that may diminish stress reactivity? The tension reduction hypothesis also leads to an examination of the stress-reducing potency of alcohol and other drugs, and to individual differences in that potency. Sex differences in the relationship between stress and drug taking, or in the stress-dampening potency of these drugs, also can be examined.

Stress, Drug Intake, and Drug Response

There is a great deal of evidence from animal studies that links exposure to stress to increases in drug self-administration. A comprehensive review of these studies is beyond the scope of this chapter. Rather, some evidence for sex differences in these effects will be highlighted.

Stress alters drug self-administration. Grunberg and his colleagues have examined the effects of stress on opiate self-administration by female and male rats (Grunberg & Cousino Klein, in press). These investigators found that physical stressors such as immobilization and mild electric footshock increased opiate self-administration in male rats over rates observed in nonstress conditions (e.g., Shaham, Alvares, Nespor, & Grunberg, 1992); changes in opiate self-administration following stress appeared to be more variable in female rats (Klein, Shaham, Alvares, & Grunberg, 1993). In addition, crowded housing conditions actually decreased opiate self-administration by female rats, but had no effect on drug intake by male rats (Brown, Klein, Rahman, & Grunberg, 1995).

Demonstrations of stress effects on drug self-administration, in which the stress is not proximal to the opportunity to self-administer drugs, also have been reported. In a study of rats, animals raised in enriched environments had a lower intake of sedative and stimulant drugs than animals raised in socially isolated environments (Zimmerberg & Brett, 1992). Among the socially isolated rats, however, males raised in social isolation preferred a stimulant drug, whereas females raised in isolation preferred a depressant drug. These results suggest that individual differences in rates of initiation and maintenance of drug self-administration may be partially determined by preexisting differences in central nervous system functioning that are due to early experiences, in particular to the stress of social isolation. Exposure to social isolation early in life may also affect drug preference, and the nature of that effect may be sex-dependent.

Stress-dampening effects of drugs. Generally, rats display a marked increase in plasma norepinephrine (NE) and epinephrine (E) levels during stress; most rats also display ethanol-induced increases in plasma NE and E in the absence of stress, although these increases are much smaller than those induced by stress (Livezey, Balabkins, & Vogel, 1987). Livezey et al. found that stress-induced increases in NE and E were significantly diminished and delayed by ethanol. Although female rats in this study showed generally higher and more variable catecholamine responses to restraint stress than male rats, variation in the stress-reducing effects of ethanol did not appear to be related to sex. In view of the probable role of genetic factors in substance abuse, it is notable that, because these rats were raised under similar conditions, the differences in stress response and in the stress-reducing effects of ethanol were most likely the result of genetic variation.

In contrast, a number of studies have found that offspring *prenatally* exposed to alcohol are *hyperresponsive* to stressors in adulthood, including psychological stressors, as well as physical stressors such as cold and ether. Females appear to be more vulnerable than males to the prenatal effects of ethanol on stress responsiveness, as they are to the effects of prenatal stress exposure. These effects occur through effects on the development

of the fetal hypothalamic-pituitary-adrenal axis, and result in elevated levels of brain and plasma corticosterone, reduced adrenocortical responses to stressors, and reduced response to drug challenges (e.g., ethanol and morphine) during the preweaning period (Weinberg, 1992).

Stress modifies drug effects. Another dimension of the relationship between stress and psychoactive drugs is revealed by studies that show that stress may alter drug response. In a study of the effects of postnatal stress on drug response, Zimmerberg and Shartrand (1992) examined response to a stimulant drug in rats separated from their mothers early in development and raised at either nest or room temperature. Those separated and raised at nest temperature were less sensitive to amphetamine, as measured by locomotor response to the drug, than were control rats that were not separated from their mothers; those separated and raised at room temperature were more sensitive. Although there were no sex differences in the effects of early maternal separation on amphetamine sensitivity in adult rats, the time course of amphetamine effects differed for males and females. Activity levels in female rats increased steadily over time; males initially increased in activity, remained stable for a period, and then increased again. Sex differences in time course may have implications for abuse potential.

The relationship between stress and drug-taking, and that between drugs and stress response, is complex. Whereas these studies suggest that there may be sex differences in the effects of stress on drug intake, and in the stress-dampening effects of those drugs, there are an insufficient number of studies to permit a thorough evaluation of the nature and causes of those sex differences.

Stress Reactivity as a Trait

Are organisms that are characterized by high levels of stress reactivity more vulnerable than "low reactors" to the effects of psychoactive substances which diminish that stress reaction? Behavior-genetic studies of selective breeding provide a means to address this question in animals; the family-history, or "high-risk" design, which has been used extensively in the past 15 years to study factors that predispose to alcoholism, provides a means to address a slightly different version of the question in humans.

Selective breeding studies. The Maudsley selective breeding study of emotionality in rats, begun in the early 1950s by Broadhurst (1960), represents the longest-standing and most extensive investigation of its kind. Maudsley Reactive (MR) and Maudsley Nonreactive (MNR) strains were selectively bred for high and low open-field defecation (OFD) as an animal model of Eysenck's construct neuroticism (Eysenck, 1967). OFD is considered to be a reasonable indicator of emotionality, or stress reactivity, in the photophobic, agoraphobic rat (Blizard, 1981).

Because successful modification of a trait through selective breeding implies a genetic influence on that trait, the establishment of the MR and MNR lines provided evidence of a genetic effect on emotionality. Once reliable OFD differences were established, generations of sib-sib matings within each line set the genes responsible for the

observed strain differences, resulting in the persistence of OFD differences after the selection procedure was discontinued (Blizard, 1988). Subsequently, the strains have been characterized and compared on a wide variety of behavioral, cardiovascular, endocrinological, and neurochemical measures. For example, relative to MNR rats, MR rats have been found to perform active avoidance conditioning less efficiently (Broadhurst & Levine, 1963), to develop more pronounced conditioned emotional responses (Singh, 1959), and to show lower basal sympathetic tone (Blizard, Liang, & Emmel, 1980) and a greater sympathetic nervous system response to stress (Blizard & Liang, 1979). Recent findings of an enhanced tyrosine hydroxylase response to stress in the locus ceruleus of Nonreactive rats have led to the hypothesis that the LC is the neural mediator for differences between the Maudsley strains (i.e., that the alleles capable of influencing the function of the LC have been selected for in the MR and MNR strains) (Blizard, 1988). Because the LC is believed to exert an inhibitory influence on the peripheral sympathetic nervous system, the attenuation in LC reactivity in the MNR line is consistent with the diminished response of that line to stress.

MR rats, under a variety of conditions, consume larger quantities of ethanol than the MNR rats, and are less responsive to the conflict-reducing effects of the benzodiazepines (Commissaris, Harrington, & Altman, 1990). These differences are hypothesized to relate to strain differences in the characteristics and function of the GABA/benzodiazepine receptor complex. In light of these strain differences in drug response, one might predict a relationship between benzodiazepine response and threshold for, or intensity of, response to a stressful stimulus in humans. That is, if the same mechanism (i.e., the GABA receptor) mediates stress reactivity and response to benzodiazepines, one would expect to find a correlation between variation in stress reactivity and drug response. Such studies have not been conducted in humans, nor have sex differences in this relationship been explored in the Maudsley experiment.

In another selective breeding study, sex differences in response to cocaine, a stimulant drug, were examined in groups of rats differing in their genetically-distinct locomotor response to novelty (Haney, Castanon, Cador, LeMoal, & Mormede, 1994). Two lines of rats, selectively bred to show high and low avoidance in response to stress (Roman High Avoidance, RHA; and Roman Low Avoidance, RLA) differed in their behavioral response to acute and chronic cocaine. Certain of these inherited differences appeared to be modulated by gonadal hormones. Only RHA rats demonstrated stereotypic grooming and sniffing. In males, the occurrence of stereotypies was associated with diminished locomotor activity. RHA females also inherited a propensity to exhibit stereotypic behavior, yet unlike males, locomotor activity was not influenced by the occurrence of stereotypies. These two behavioral responses were simultaneously manifested because of the sensitivity of the RHA females to the facilitatory influence of ovarian hormones on locomotor activity. Haney et al. suggest that ovarian hormones modify the effects of cocaine through effects on the dopaminergic system, as estrogen has been shown to act directly on dopamine neurons, both pre- and postsynaptically (Hruska, 1986).

Researchers at the Veteran's Administration and University of Arkansas began a selection experiment in the 1960s which resulted in the development of a strain of pointer dogs that has maintained nervous characteristics for more than eight generations (Reese, 1979). Studies on the behavioral, physiological, and biochemical correlates of this characteristic continue at the University of Arkansas and also at the National Institute of Mental Health (e.g., Klein, Lenox, & Uhde, 1988). The prominent nervous behaviors exhibited by these dogs include "excessive timidity, hyperstartle, reduced exploratory behavior, and frequent rigid immobility in the presence of man" (Reese, 1979, p. 1168). In fact, "the most potent stimulus for maladaptive nervous behavior [in these dogs] ... is man, [and this effect] cannot be vitiated by increase of friendly human contact during development, nor by foster-parent rearing by normal mothers" (Reese, 1979, p. 1171). This characteristic is particularly interesting, as it suggests that, in addition to an inherited tendency toward emotionality that is conceptually similar to that exhibited by the MR rats, these dogs are predisposed to react fearfully to a particular stimulus (i.e., man). In addition, the nervous dogs are poor at operant conditioning, have a very low heart rate, respond to psychoactive drugs by a decrease in their antisocial behavior, and seem to respond more to negative than to positive reinforcement (Wimer & Wimer, 1985). Research on physiological and biochemical correlates of this fearful behavior reveals that this strain is characterized by a lower density of opioid receptors in brain (Angel, McMillan, Newton, & Reese, 1983), as well as by abnormal dopaminergic function (Shideler, DeLuca, Newton, & Angel, 1983). In addition, it has been observed that the behavioral abnormalities of nervous dogs improve markedly during treatment with chlordiazepoxide (a minor tranquilizer), and improve some following ingestion of alcohol or phenobarbital. In contrast, amphetamine and cocaine adversely affect nervous dogs, while having little effect on normal dogs (Reese, 1979). Again, as with the Maudsley experiment, a relationship between stress reactivity and drug response is apparent; the nature of that relationship and potential sex differences need to be explored further.

Vulnerability to substance abuse. For many years, studies in which alcoholics were compared with control subjects provided the primary means of identifying characteristics that might contribute to a predisposition to alcoholism. Conclusions reached on the basis of these studies were limited, however, because a difference between the two groups could be the result of many years of heavy drinking, rather than a contributor to a preexisting vulnerability (Hill, 1995).

"For any familial disorder, the offspring of affected parents will be affected more frequently than individuals sampled from the general population" (Hanson, Gottesman, & Meehl, 1977, p. 575). A sample of offspring of alcoholics who have not yet passed through the period of risk will include individuals who are not yet drinking heavily, but who may become alcoholic. Moreover, in a multifactorially determined disorder with some genetic contributions, biological relatives may be carrying components of the biological predisposition without actually being affected. Thus, the "family-history" method identifies subjects who are at high risk for developing alcoholism by virtue of their family history, who are themselves not alcoholic. Most often, offspring of alcoholic fathers are studied; Hill and her colleagues are conducting the first study of offspring of female alcoholics (Hill, 1995). These individuals are matched and compared to nonalcoholic offspring of control subjects. This method has been used extensively and effectively in the

past 15 years to study characteristics that comprise vulnerability to substance abuse, including neurophysiological indices of information processing recorded at baseline (e.g., Elmasian, Neville, Woods, Schuckit, & Bloom, 1982), in response to alcohol (e.g., Polich & Bloom, 1988) and other drugs (Gabbay, Duncan, & Mirsky, 1995a); subjective response to alcohol (e.g., Schuckit, 1980); and psychomotor variables such as body sway (e.g., Hill & Steinhauer, 1993). It is notable that, with few exceptions (e.g., Lex, Lukas, Greenwald, & Mendelson, 1988), women have been excluded from these studies. This exclusion has been explained on the basis of methodological difficulties imposed by menstrual cycle variation, and because the genetic contribution to alcoholism has not been as clearly established as that for men. Nevertheless, our understanding of the factors predisposing women to alcoholism is limited by this exclusion.

Only a limited number of studies have used the "family-history" design to examine the reaction to stress in family-history positive, or "high risk," subjects. Using autonomic measures of reactivity, three studies have demonstrated that nonalcoholic males with a family history of alcoholism hyperreact to threatening stimuli, such as signalled electric shock, and that alcohol consumption essentially eliminates this reactivity (see Pihl & Peterson, 1991, for a summary). Levenson and his colleagues (Sher & Levenson, 1982; Levenson, Oyama, & Meek, 1987) extended this finding by using a different criterion to define risk: individuals scoring high on personality scales shown to be related to risk for alcoholism showed a greater reduction in stress reactivity following alcohol than did low-risk subjects.

It is interesting that there is also evidence that high-risk subjects hyporeact to stimuli that are boring or repetitive (e.g., Gabbay, Duncan, & Mirsky, 1995b), suggesting that individuals with family history of alcoholism also may be at risk for abusing stimulant drugs.

In the only one of these studies that included women, Levenson, Oyama, and Meek (1987) found no evidence of sex differences in the ability of alcohol to attenuate response to stress. Given the evidence that stressors are not equipotent for males and females (e.g., Brown & Grunberg, 1995), studies are needed in which the effects of alcohol on a variety of stressors are examined in women and men at high and low risk for alcoholism. Moreover, whereas Levenson et al. (1987) controlled for menstrual cycle, it will be important in future studies to vary menstrual phase systematically, to determine whether interactions between stress and family history of alcoholism are phase-specific.

Negative affectivity. Recent developments in affectivity research have been applied in theories of vulnerability to drug abuse (Pandina, Johnson, & Labouvie, 1992). Theoretical and empirical advances in this field forge a link between the stress-substance use literature described in previous sections, in which a "high-drive state" (Conger, 1951, 1956), or tension, is assessed using behavioral (animal studies) or autonomic measures (human studies), and a literature that focuses on psychological antecedents of substance use. The hypothetical tension reduction by alcohol, which is thought to reinforce the response of alcohol consumption, can be understood in terms of negative affectivity and arousal. Specifically, Pandina et al. have proposed that "individuals characterized by pervasive and persistent negative affectivity and energized by prolonged and heightened arousability are especially vulnerable to the transit from ... casual [substance] use to more intensive and problematic use" (p. 179).

Among those studying the structure of mood, it is generally accepted that affectivity may be partitioned into two independent dimensions, positive affectivity (PA) and negative affectivity (NA) (Watson & Clark, 1984; Watson & Tellegen, 1985). Individuals high on the NA dimension tend to be distressed, upset, nervous, and tense, even in the absence of overt external stressors. Such individuals tend to dwell on and amplify mistakes, frustrations, and threats. High-NA individuals are particularly sensitive and hyperreactive to minor failures and the hassles of daily living. High scorers on Negative Affectivity, as assessed on the Multidimensional Personality Questionnaire (Tellegen, 1982), describe themselves as being "unpleasurably engaged, stressed and harassed, [and] prone to experiencing strong negative emotions such as anger and anxiety," while low scorers "have a higher threshold for negative affect" (Tellegen et al., 1988, p. 1033). NA is fairly stable across situations and across developmental stages, and has been found to be partially under genetic control (Tellegen et al., 1988).

Studies of the psychological and psychosocial correlates of drug use can be interpreted in a manner consistent with this theory. Based on a review of the literature, Kaplan and Johnson (1992) argue that substance use is one of several alternative activities that reduce a sense of unease and despair, and that there is empirical evidence of the use of psychoactive substances to self-medicate and reduce painful feelings. They argue, further, that "drug use intended to erase consciousness of pain, problems, and anxieties will be addictive" (p. 313), and may lead to escalating use and decreased social functioning. Thus, individuals using alcohol and other drugs to reduce negative affectivity may be at higher risk for drug abuse and dependence disorders than those whose substance use arises from a different set of antecedents. Moreover, Kaplan and Johnson (1992) found that the effect of self-reported reduction in negative affect as a result of drug use is more highly correlated with escalation of use in young women than in young men. That is, women are more vulnerable than men to the reduction, or perceived reduction, in negative affect by drugs, and are more likely than men to escalate their use as a result of that perception.

Studies of psychological factors that motivate excessive drinking in adults are consistent with this finding, but complicate the picture somewhat. Beckman (1980) found that both women and men alcoholics reported drinking for relief of unpleasant affect, whereas women but not men reported that feelings of powerlessness and inadequacy often preceded their drinking. Thus, it may be that there are sex differences in the potency of stressors to elicit negative affect. Specifically, the stress associated with feelings of inadequacy may be a particularly potent negative-affect-inducing stressor for women, and thus may precipitate drinking more in women than in men.

Analyses of the 1985 NIDA Household Survey data also revealed some sex differences in the psychosocial correlates of drug use (Robbins, 1989). There were nonsignificant trends for females to be more likely than males to report "intrapsychic" problems, including being depressed, feeling irritable and upset, and feeling suspicious and mistrustful; males were more likely than females to report psychosocial problems associated with their alcohol or drug use. In another study, women were more likely than men to cite specific reasons for drug use, women were diagnosed more often as having major depression, and their depressive symptoms improved much more slowly than men's when drug free. In contrast, the reports of men in this study suggested they use cocaine as

part of a larger pattern of antisocial behavior (Griffin, Weiss, Mirin, & Lange, 1989). Thus, although there is limited evidence that reduction in negative affectivity may play a greater role in the maintenance and escalation of drug use by women than in that by men, the picture is complex and more studies are needed.

Biological Mediators of Stress and Drug-Related Behaviors

A great deal is known about the biological mediators of drug-taking behavior and drug effects (see Julien, 1992, for a review), and there appears to be overlap in the biological mediators of drug use and stress (e.g., Piazza et al., 1991). Although such overlap does not suggest that the two are alternate reflections of the same diathesis, given the apparent behavioral relationship between stress and drug use, a clear understanding of the biological commonalities should generate hypotheses that may be tested. Of particular relevance in this context, there is evidence for sexual dimorphism in some of the structures (Baum, 1986) and neurochemical processes (Lancaster, 1994) common to stress and drug use.

Dopamine, Stress, and Drug Use

Dopamine and corticosterone. The most extensive body of work linking drug abuse vulnerability and stress response, on a behavioral as well as a neurochemical level, comes from the work of Piazza and his colleagues (e.g., Piazza et al., 1991). These studies have found that, in rats, vulnerability to amphetamine self-administration can be predicted on the basis of locomotor response to novelty (which, in rats, is considered a measure of stress response). Behaviorally high-responding rats also display a sustained release of corticosterone in the novel environment, and corticosterone is known to have an activating effect on dopamine neurons. The reinforcing effects and self-administration of psychostimulants, as well as other classes of drugs including alcohol, are known to be mediated in part dopaminergically (Koob & Bloom, 1988). This body of work therefore provides a link between stress reactivity, drug response, and vulnerability to drug abuse. Although none of these studies address the issue of sex differences, the dopamine system is known to be affected by estrogen (e.g., Hruska, 1986), providing a potential means for modulation of sex differences in vulnerability to drug abuse.

Startle response. In humans, it is difficult to study individual differences in neurotransmitter activity; it is particularly difficult to examine transient changes in neurotransmitter levels, such as those that would characterize response to stress. Because the startle response, or prepulse inhibition (PPI), is known to be dopaminergically mediated, it provides a noninvasive means of assessing biological concomitants of the mechanisms underlying stress reactivity. PPI is the normal reduction of a startle response that occurs when the startling stimulus is preceded by a weak prepulse (e.g., Graham, 1975). PPI is considered to be an involuntary inhibitory process that provides an operational measure of sensorimotor gating, or the filtering of incoming stimulation from the environment. If stress reactivity is related to the ability to screen out or dampen the impact of stressful stimulation, individual differences in sensorimotor gating, as assessed

by the PPI, may be relevant to an understanding of differences in stress reactivity and coping. PPI is known to be impaired in patients with three specific neuropsychiatric disorders that are characterized by an inability to gate or inhibit extraneous or nonsalient information including schizophrenia, obsessive-compulsive disorder, and Huntington's disease. Studies of PPI and vulnerability to drug use in humans, however, are lacking.

Swerdlow et al. (1993) reported that women exhibited significantly less PPI than men, particularly with weak prepulses. Whereas this finding needs to be replicated, and the effects on PPI of variation in hormonal levels throughout the menstrual cycle investigated, this sex difference suggests a mechanism that may contribute to sex differences in stress reactivity. Because PPI is known to be dopaminergically mediated, studies of PPI in those known to be at high risk for drug abuse will be important. The sex differences in PPI, together with the known effects of estrogen on dopaminergic function, suggest further that studies of PPI in women and men at risk for substance abuse may help to elucidate psychobiological bases of the sex differences in drug use.

Molecular-genetic mechanisms. Several genes have been proposed as potential markers of the genetic liability to alcoholism, including the D₂ dopamine receptor (DRD2) gene (e.g., Noble, 1993). The dopaminergic system, and the D₂ dopamine receptor in particular, have been implicated in drug abuse, most likely through mediation of the reinforcing effects of psychoactive drugs (e.g., Koob & Bloom, 1988). As would be expected in the case of a polygenically influenced trait, the evidence is not consistent with a one-to-one relationship between a diagnosis of alcoholism and genetic variation at the D₂ locus (e.g., Stone & Gottesman, 1993). Rather, genetic differences at this locus may be associated with variables that contribute to liability, rather than with differences in clinical diagnosis (e.g., Gabbay, Duncan, Mirsky, & Uhl, 1995; Persico, Bird, Gabbay, & Uhl, in press).

There are no sex differences in the distribution of the DRD2 alleles (Smith et al., 1992); studies of potential sex differences in its functional effects have not been conducted. It is notable that dopaminergic function is affected by estrogen (Hruska, 1986), as this provides an example of a potentially sex-limited, genetically-mediated characteristic. That is, inheritance of the aberrant allele at the DRD2 locus by women and men may not have the same implications--effects of genetic variation at this locus in women could be modulated by the ambient hormonal environment (i.e., by estrogen). Though highly speculative, such a mechanism could contribute to sex differences in drug response. An answer to the question of whether or not this gene contributes to variance in the liability to abuse drugs awaits completion of a greater number of well-controlled studies. In any case, examination of phenotypic differences associated with alternative forms of this gene, or with variation in other putative genetic markers of substance abuse, will be important. Most relevant here, it will be important to elucidate mechanisms underlying sex differences in the effects of these genetic polymorphisms.

Gamma-amino butyric acid (GABA). The role of GABA in the modulation of alcohol and benzodiazepine response has been well-documented (Julien, 1992). Strain differences in emotionality that are correlated with preference for ethanol and with the conflict-reducing effects of the benzodiazepines were described earlier in this chapter

(Commissaris, Harrington, & Altman, 1990). Lancaster (1994) has reviewed evidence that GABA system is modulated by neurosteroids, providing yet another mechanism through which sex differences in hormone levels, as well as stress-induced hormonal fluctuations, may modulate drug effects.

Reproductive Hormones

A growing number of studies provide evidence of menstrual cycle effects on stress response (e.g., Girdler & Light, 1994; Polefrone & Manuck, 1988; Stoney, Owens, Matthews, Davis, & Caggiula, 1990), though it is not clear that reproductive hormonal fluctuations mediate those fluctuations (Polefrone & Manuck, 1987). Drug intake, as well as response to drug challenge, also have been found to vary across the menstrual cycle (e.g., Jones & Jones, 1976). Moreover, effects of estrogen on dopaminergic function have been documented (Hruska, 1986), suggesting estrogen may mediate sex differences in the reinforcing effects of drugs.

Mello and her colleagues have conducted a series of laboratory studies to examine the relationship between premenstrual distress and alcohol intake. Mello et al. (1990) found that menstrual cycle phase was associated with changes in alcohol use by some women. Women who increased drinking had significantly higher scores on impaired social functioning, hostility, anger, and hysteroid features, as measured by the Premenstrual Assessment Form. This finding suggests the stress associated with the premenstruum in some women may interact with other liabilities to produce an increase in drug intake during that phase of the menstrual cycle. Mello et al. (1985) have also reported an association between increased marijuana use and premenstrual dysphoria in women who smoked marijuana on a clinical research ward. In contrast, Tate and Charette (1991) found no correlation between alcohol consumption and menstrual distress, nor was there evidence that alcohol consumption varied significantly across five menstrual cycle phases.

Animal studies of estrous cycle effects on drug-taking provide a means of examining the relationship between menstrually linked hormonal fluctuations and drug intake, independent of the expectations surrounding human menstrual cycle phases. In drug self-administration studies, breaking points reached by female rats during estrous were higher, often dramatically higher, than those reached by the same animals during the nonestrous stages of the reproductive cycle (Roberts, Bennett, & Vickers, 1989). This means that female rats will pay a far greater behavioral price for cocaine during estrous than during other stages of the estrous cycle. This study also produced evidence that, overall, females would pay a greater price for cocaine than would males. That is, female rats reached higher breaking points than male rats (800% higher during estrous; 500% during other phases of the cycle). These results are suggestive of an effect of reproductive hormonal fluctuations on drug intake, independent of the negative attributions that characterize the premenstruum in some women.

Taken together, human menstrual cycle studies and animal studies of estrous effects on drug-taking suggest that there may be hormonally-mediated fluctuations in alcohol and drug intake associated with the menstrual cycle. Studies are needed in which that menstrual

cycle variation is examined in conjunction with factors, including stress. Of particular relevance to military women, studies such as these need to be conducted in nonabusing women. Although circannual rhythms in the androgens are less widely acknowledged, they are well-documented (e.g., Levine, 1994). Nevertheless, there are no published studies of the effects of that cyclic variation on male alcohol and drug intake, nor is there an established literature on the effects of the androgens on psychophysiological stress reactivity (Polefrone & Manuck, 1987).

Stress Mediation of Sex Differences in Alcohol and Drug Use?

It is not known to what extent differences in the prevalence of alcohol and other substance use are mediated biologically, through effects of hormones on the ability of drugs to serve as reinforcers, for example, or socioculturally, a result, perhaps, of differing societal attitudes regarding substance use by women and men. Most likely, combinations of factors will be found to explain sex differences in substance use most effectively.

Animal and human studies reveal effects of proximal and distal stress on alcohol and drug intake; there is also evidence that alcohol may attenuate the response to stress, and that prenatal exposure to alcohol affects later response to stress. Animals bred to be highly stress reactive appear to self-administer more alcohol than animals bred to be less stress reactive. Finally, individuals known to be at high risk to alcoholism, by virtue of their family history, may hyperreact to stress.

A growing body of scientific research suggests there may be sex differences in the perception of stress, in stress reactivity, and in the effects of drugs on the stress response. This research suggests that application of a variety of experimental approaches to the study of stress and substance use can be applied fruitfully in an attempt to understand the etiology of alcohol and drug use and abuse. Moreover, a clearer understanding of the role of stress in substance use may contribute to an understanding of sex differences in substance use.

Summary and Recommendations

There are clear sex differences in the prevalence of alcohol and other substance use and abuse. Women appear to use most classes of drugs less frequently than men, and to be less vulnerable than men to alcohol and substance abuse disorders. In contrast, women report more use of sedatives and tranquilizers than men, and more women than men take prescription drugs for nonmedical purposes. Moreover, the number of military women who report using alcohol or tobacco heavily is substantial. That use may have damaging effects on their health, and disruptive effects on their performance of military assignments. Thus, it may be detrimental to the goal of military readiness to minimize, on the basis of the prevalence data, the importance of alcohol and drug use among military women.

As a result of a major effort on the part of the National Institutes of Health, it is likely that, in the next decade, a more comprehensive understanding of sex differences in the etiology of alcohol- and drug-related behaviors will emerge. Parallel studies of military

women are few, although current initiatives may alter this (IOM, 1995). It will be important, in general, to conduct more studies that include women as subjects, and specifically, to conduct studies in which men and women are tested under identical experimental conditions. Given the apparent relationship between stress and drug-taking, and a growing amount of evidence for sex differences in the experience of and reaction to stress, more studies need to be done to test hypotheses of sex differences in the relationship between stress and drug-taking. To the extent that military women are exposed to a unique set of stressors, studies of the interplay between this stress and substance use need to be conducted. Military women and men may provide a unique resource to study the relationship between stress and substance use, as well as sex differences in that relationship (Bray, Fairbank, & Marsden, this volume). Similarly, the opportunity to investigate genetic and environmental contributions could be furthered by the establishment of a twin registry comprising military women.

In addition, sex differences in the effects of drugs on performance (e.g., Martin et al., 1985; Niaura et al., 1987; Palva, 1985), and in the efficacy and safety of psychotropic medications (Dawkins & Potter, 1991; Yonkers et al., 1992), topics that have not been included in this chapter, need to be studied further. Both topics are relevant to the health and performance of military women. Indeed, in the population of military women, for whom exposure to stress is common, such studies need to ask also whether stress modifies drug effects on performance, and whether stress alters the efficacy or safety of psychotropic medications.

To some degree, informed policy recommendations must await the conduct of more research that includes women. It is clear, however, that in both women and men, stress may alter the tendency to use drugs, while also affecting response to those drugs. Moreover, drug use may alter stress reactivity, and stress may modify the response to alcohol and other drugs. Given the prevalence of exposure to stress among military personnel, special attention should be given to individuals or groups of individuals who may be experiencing acute stress (e.g., exposure to mutilation) or persistent stress (e.g., long-term deployment).

One final point, made salient by the rapid advances in molecular technology, should be emphasized. Those rapid advances have led to the development and wide availability of genotyping tests, raising ethical questions regarding the use of such tests for the purposes of exclusion (e.g., from occupational specialties, military ranks, insurance policies) (British Medical Association, 1992). An important implication of a multifactorially determined, polygenic (i.e., involving more than one gene) etiology is that knowledge of genotype, or of environmentally-defined risk factors, *does not permit unambiguous identification of individuals who will develop alcohol and substance abuse problems*. Rather, as factors are identified that contribute to the liability to abuse alcohol and other drugs, those factors should be interpreted as guideposts for creating an environment that generally increases resilience to the effects of stress, and specifically, diminishes liability to abuse alcohol and other drugs.

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**Stress and Substance Use
Among Military Women and Men**

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Introduction

Military women and men may be subject to a wide range of stressors as part of their military work assignments and duties. Such stressors may be associated with the physical or mental challenges of their jobs, demands placed on them because of a shortage of other personnel, exposure to trauma associated with combat, or conflicts between military and family responsibilities. In addition, military women may experience stress associated with being a woman in a predominantly male environment or because of sexual harassment they may encounter. Military personnel are also likely to experience the same stressors as other people outside the Military, including the press of family and work responsibilities, and uncertainties introduced by changing economic conditions.

Psychosocial theories of stress generally recognize the importance of cognitive factors in the development and maintenance of stress-related symptoms and problems in life functioning. Folkman and Lazarus (1980, 1985), for example, proposed a psychosocial model that emphasizes the important role that cognitive appraisal plays in the development and maintenance of stress-related adjustment problems. Indeed, a number of experimental and applied studies have shown robust relationships between individuals' appraisal of the level of stress associated with specific life events, chronic stressors, and their capacity to function effectively (cf., Foa, Steketee, & Olasov Rothbaum, 1989).

Several decades of research also point to the multidimensional nature of reactions to stress, and that such reactions may vary by gender (e.g., Horwitz & Davies, 1994). Numerous studies have reported strong relationships between stress, alcohol consumption, and emotional problems, with particularly robust connections between stressful life events and depression for women (Pianta & Egeland, 1994) and stress and alcohol abuse for men (Bromet, Dew, Parkinson, & Schulberg, 1988; Gorman, 1988; Horwitz & Davies, 1994).

Another characteristic of research to date is that findings on the relationship of stress to substance use and emotional problems vary from study to study. Gorman (1988) noted that certain features of occupational environments serve as stressors that increase risk for alcohol abuse among both men and women. Indeed, a number of studies have found elevated rates of alcohol consumption among those with elevated levels of occupational stress, particularly among men (Horwitz & Davies, 1994). Other studies have found increased rates of cigarette smoking and coffee drinking as a response to high stress, but no relationship between high stress and alcohol consumption (Conway, Vickers, Ward, & Rahe, 1981). Similarly, in some studies of women, alcohol use has not been elevated, but psychotropic medication (e.g., tranquilizers) has been (Brown-Rowat, Amsel, & Jeans, 1990; Frone, Cooper, & Russell, 1994). Further, some studies have found that respondents actually reduced their alcohol use during stressful periods (Breslin, O'Keefe, Burrell, Ratliff-Crain, & Baum, 1995).

Discrepancies between study findings may reflect meaningful differences in research methods, predisposing characteristics of study populations, and the type and severity of the stressor under study. In addition, other factors may influence the relationship between stress and substance abuse, such as respondents' sociodemographic characteristics and coping styles. For example, research has shown that stressors are

highly predictive of drinking problems among men who rely on avoidance coping strategies (Cooper, Russell, Skinner, Frone, & Mudar, 1992). In contrast, women who rely on problem-focused strategies drink less during high-stress weeks than women low on problem-focused coping (Breslin et al., 1995).

Exposure to traumatic stressors has been strongly implicated in the elevated rates of substance abuse and dependence among veterans (McFall, Mackay, & Donovan, 1992), and substance abuse has been found to be highly comorbid with post-traumatic stress disorder (Kulka, Schlenger, Fairbank, Hough, Jordan, Marmar, & Weiss, 1990). Women who served in Vietnam and experienced high levels of war zone stress were found to have significantly higher rates of alcohol abuse and dependence than other women veterans of the Vietnam era, while women theater veterans who were exposed to lower levels of such stress did not have significantly more alcohol disorders than other women veterans of the Vietnam era (Kulka et al., 1990).

Although these studies indicate a relationship between stress and substance use, the extent of the generalizability of their findings to today's active-duty Military is unknown. This chapter builds on these prior studies and extends them by examining the relationship between stress and substance use among military personnel under noncombat, peacetime conditions among the current active force. Whereas most prior studies have focused on alcohol, the present study examines the relationship of stress and heavy drinking, any illicit drug use, and cigarette smoking.

Data for the present study were drawn from the series of Department of Defense (DoD) Surveys of Health Related Behaviors Among Military Personnel conducted in 1980, 1982, 1985, 1988, 1992, and 1995 (Bray et al., 1983, 1986, 1988, 1992, 1995a; Bray, Kroutil, & Marsden, 1995b; Bray, Marsden, Herbold, & Peterson, 1993; Burt, Biegel, Carnes, & Farley, 1980). Trends in substance use are examined across the series of surveys. Findings on stress, coping, and the relationship of substance use and stress draw on the 1995 survey data.

Methods

Sampling Design and Data Collection

The sampling designs and data collection methods have been similar throughout the DoD survey series and are illustrated with the methods used for the 1995 survey. The 1995 sample was selected using a deeply stratified, two-stage, two-phase probability design. The eligible survey population consisted of all active-duty military personnel except recruits, Service academy students, persons absent without official leave (AWOL), and persons who had a permanent change of station (PCS) at the time of data collection. The first stage of sampling involved selection of major military installations stratified by Service (Army, Navy, Marine Corps, Air Force) and world region (within the continental United States [CONUS], and outside CONUS [OCONUS]). Within the selected installations, the second stage of sampling involved selection of military personnel stratified

by military pay grade, including three enlisted pay grade strata (E1-E3, E4-E6, E7-E9) and three officer pay grade strata (warrant officers in grades W1-W5 and commissioned officers in grades O1-O3 and O4-O10). The sample was selected to be representative of the active-duty force worldwide. Officers and women were oversampled because of their smaller numbers.

During data collection, respondents anonymously completed self-administered questionnaires that took about 55 minutes on average to answer. Most respondents (88% in 1995) attended group sessions at 59 installations where questionnaires were administered by civilian data collection teams. Eligible personnel who did not attend group sessions were mailed a questionnaire along with an explanation of the purpose and anonymity of the survey and instructions for completing and returning it.

These procedures produced large sample sizes and respectable response rates for each of the surveys. The sample sizes were 15,268 in 1980, 21,936 in 1982, 17,328 in 1985, 18,673 in 1988, 16,395 in 1992, and 16,193 in 1995. Response rates ranged from 70% to 84%. The survey data were weighted and poststratified to reflect the representation of respondents in the population, and adjustments were made for the potential effects of nonresponse.

Description of Measures

Core sets of comparable items on substance use were used across the survey series. The analyses in this chapter deal with three of these variables: heavy drinking, use of any illicit drug, and any cigarette smoking. Heavy drinking refers to consuming five or more drinks per typical drinking occasion at least once a week during the past 30 days and is based on a drinking-level classification scheme adapted from Mulford and Miller (1960). Any illicit drug use refers to any use during the past 12 months of marijuana or hashish, phencyclidine (PCP), lysergic acid diethylamide (LSD) or other hallucinogens, cocaine, amphetamines or other stimulants, tranquilizers or other depressants, barbiturates or other sedatives, heroin or other opiates, analgesics or other narcotics, inhalants, or "designer drugs." Because of the relatively low prevalence of any illicit drug use during the past 30 days, results are presented for the past 12 months.

Cigarette use was measured in terms of lifetime numbers of cigarettes smoked and the average daily number of cigarettes smoked in the past 30 days. Current smokers were defined as military personnel who reported that they smoked at least 100 cigarettes in their lifetime and who smoked at least once in the 30 days prior to the survey.

Military women and men were asked to appraise the perceived levels of stress that they experienced at work and in their personal relationships and family life. All participants were asked the following two items, and military women were additionally asked the third item:

- During the past 12 months, how much stress did you experience at work or while carrying out your military duties?
- During the past 12 months, how much stress did you experience in your family life or in a relationship with a person you live with or date seriously?
- In the past 12 months, how much stress did you experience as a woman in the military?

These items on perceived stress were complemented with items about sources of stress and behaviors used to cope with stress. Together, these measures provide the basis for examining relationships between substance use and stress.

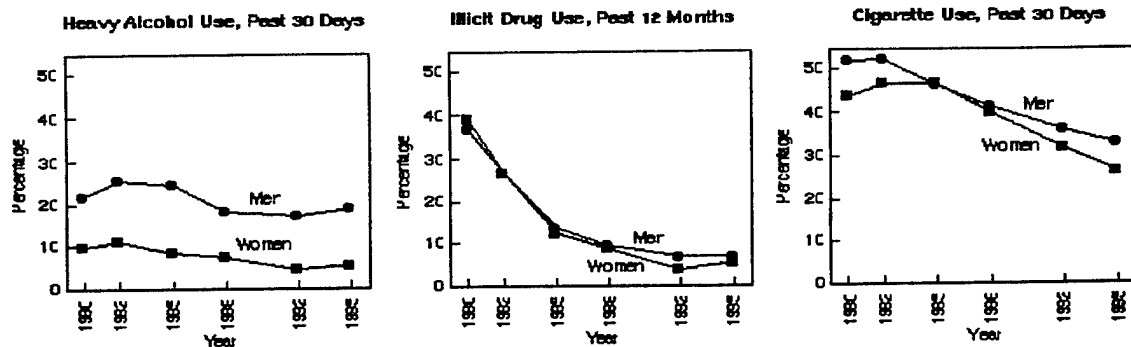
Analysis Procedures

Population prevalence estimates and associated standard errors were computed from weighted survey data using the SURvey DATA ANalyis (SUDAAN) software package (Shah, Barnwell, & Bieler, 1995). Logistic regressions were also computed using SUDAAN to model outcome measures of heavy drinking, illicit drug use, and cigarette smoking.

Findings

Trends in Substance Use Among Military Women and Men

Figure 1 presents the trends over the six DoD surveys from 1980 to 1995 of the percentage of active-duty women and men who engaged in heavy alcohol use, any illicit drug use, and any cigarette use. Data on heavy alcohol use and cigarette smoking are presented for the past 30 days prior to the survey period, whereas illicit drug use is assessed for the past year. The past year time period rather than the past month is used for illicit drugs because of the low prevalence of illicit drug use in the later years of the survey series. As shown, heavy alcohol use, illicit drug use, and cigarette use all declined significantly between 1980 and 1995, although the rate of decline varied for each of the substances and between each of the six surveys.



Sources: DOD Survey of Health Related Behaviors Among Military Personnel, 1980 to 1995.

The prevalence of heavy alcohol use during the past 30 days for military women showed an overall significant decline from 9.6% in 1980 to 5.3% in 1995. For military men, the prevalence of heavy drinking dropped slightly, but significantly, from 21.8% in 1980 to 18.8% in 1995. The trend in heavy drinking over the six surveys for women generally showed a gradual decline, although in 1995 it showed a slight upturn. For men, heavy drinking was relatively stable from 1980 to 1985, decreased significantly between 1985 and 1988, and then remained at about the same level between 1988 and 1995. Throughout the survey period, military men consistently showed a higher prevalence of heavy alcohol use than military women; men were two to three times more likely than women to drink heavily. These gender differences in heavy drinking are consistent with patterns of heavy drinking in the civilian sector, with men more likely to drink heavily than women (Substance Abuse and Mental Health Services Administration [SAMHSA], 1995).

The prevalence of any illicit drug use showed a similar pattern for military women and men, with sharp declines from 1980 through 1985, followed by continued but more gradual declines and a tapering off in 1992 and 1995. For military women, illicit drug use during the past 12 months declined sharply from 39.0% in 1980 to 5.3% in 1995; for military men, it dropped from 36.5% in 1980 to 6.7% in 1995. The rate of decrease was much greater than for heavy alcohol use, and the decreases were statistically significant between each of the surveys from 1980 to 1992, but showed no significant change between 1992 and 1995. The similar rates of illicit drug use between military women and men differs from that found in surveys of civilians, which show higher rates of use by men (SAMHSA, 1995).

The percentage of military personnel who smoked cigarettes in the past 30 days also decreased substantially during the 15-year period. Smoking among military women declined from 43.6% in 1980 to 26.3% in 1995; among military men, it declined from 51.7% in 1980 to 32.7% in 1995. The trend for women showed high and relatively level smoking rates between 1980 to 1985, followed by a steep and steady decline through 1995. For military men, smoking rates showed no significant change between 1980 and 1982, but decreased significantly between each of the later surveys. Nonetheless, despite clear progress in reducing the prevalence of smoking, the 1995 rate was considerably higher than the *Healthy People 2000* objective of 20% adopted for the Military (PHS, 1991).

Considered together, the trend data on substance use indicate that all three substances showed statistically significant reductions in use across the period from 1980 to 1995 for both women and men. Despite impressive progress, much remains to be done to combat substance use. Smoking rates still remained high for both women and men; in 1995, roughly one out of four military women and one out of three military men were current smokers. Heavy drinking showed the least change over the years and remained particularly problematic for men. In 1995, about 1 in 5 men but only 1 in 20 women was likely to be a heavy drinker. Drug use showed the most dramatic drop over time. In 1995, illicit drug use was at relatively low levels; about 1 in 20 was likely to use illicit drugs in the past year among men and also among women. Somewhat surprisingly, over the survey period, military women were about as likely as men to use illicit drugs and to smoke cigarettes (although since 1988, smoking among military women declined at a sharper rate than among military men).

Although it is clear that substantial substance use was reported among military personnel, our primary interest here is to examine whether it was related to stress experienced by military women and men. To do that, we examine the types and levels of stress perceived by military personnel, consider the basic methods used to cope with stress, then assess the association between substance use and stress.

Appraisal of Stress

Table 1 shows the levels of perceived stress at work, in the family (or personal relationships), and associated with being a woman in the Military. The distributions across response categories indicate three key findings. The first finding is that both military women and men were more likely to describe their military duties as stressful than their

The second finding concerns gender differences among women and men in the events that they consider highly stressful. Military women were somewhat more likely to feel high levels of stress in their family or personal relationships (29.3%) than were men (21.5%), but women and men were equally likely to feel high stress in their military work (about 40%). This finding may reflect role differences in family settings in which women assume greater responsibility for child care and household duties and hence may feel more pressures associated with family duties.

The third finding, which applies to women only, is that a third (33.0%) experienced high stress associated with being a woman in the Military. This percentage is slightly higher than the percentage experiencing stress in their family life (29.3%), but smaller than the percentage reporting stress at work (40.1%). Although military women were more likely to experience high stress from military work, a substantial percentage were likely to experience high stress as a result of being a woman in the Military. It is not clear whether this gender-based stress is a result of (a) some features of military life that make it difficult for some women to function, (b) being a woman in a predominantly male organization, (c) poor coping skills among some military women, or (d) some combination of these or other factors.

Table 1*Levels of Perceived Stress Among Military Women and Men*

Type of Stress/ Level of Stress	Women	Men	Total DoD
Stress at Work			
Great deal	17.6	15.7	16.0
Fairly large amount	22.5	23.4	23.3
Some	30.7	29.7	29.8
A little	22.7	20.6	20.9
None	6.5	10.5	10.0
Stress in Family			
Great deal	13.4	8.8	9.3
Fairly large amount	15.9	12.7	13.1
Some	27.3	27.1	27.2
A little	26.9	30.6	30.1
None	16.6	20.8	20.3
Stress Being a Woman in Military			
Great deal	16.2	NA	16.2
Fairly large amount	16.8	NA	16.8
Some	35.4	NA	35.4
A little	18.4	NA	18.4
None	13.2	NA	13.2

Note: Table entries are column percentages of personnel who reported the indicated levels of stress in the past 12 months.

NA = Not applicable.

Source: DoD Survey of Health Related Behaviors Among Military Personnel, 1995. family or personal lives. Among women, nearly 4 out of 10 (40.1%) perceived high levels of stress at work (i.e., a "great deal" or a "fairly large amount") compared to about 3 out of 10 (29.3%) who experienced high levels of stress in their families or personal relationships. Among men, a comparable 4 out of 10 (39.1%) perceived high stress at work compared to slightly more than 2 out of 10 (21.5%) in their families. In addition, women rated military work somewhat more stressful (40.1%) than being a woman in the Military (33.0%).

Specific Sources of Stress

We attempted to enhance our understanding of the nature of perceived stress through the following specific question on potential sources of stress in the domains of work and family life: During the past 12 months, how much stress did you experience from each of the following?

- being deployed at sea or in the field;
- having a PCS;
- problems in your relationships with the people you work with;
- problems in your relationship with your immediate supervisor(s);
- concern about being separated from the Military;
- increases in your workload;
- being away from your family;
- changes in your family, such as the birth of a baby, a divorce, or a death in the family;
- conflicts between your military and family responsibilities;
- problems with money;
- problems with housing;
- health problems that you had; and
- health problems in your family.

Table 2 presents the responses to this question for women and men. It shows that, for women, the most frequently mentioned sources of stress were being away from family (21.1%); major changes in family, such as birth or death of a loved one (17.0%); increases in workload (15.9%); problems in work relationships (15.7%); and problems with supervisors (13.1%). For men, the most frequently mentioned sources of stress were being away from family (23.7%), deployment (17.1%), increases in workload (16.6%), financial problems (15.0%), and conflicts between military and family responsibilities (13.0%).

Overall, the percentages of men and women who identified the different specific problems as significant sources of stress were quite comparable. For example, Table 2 shows that housing problems were a major stressor for 7.6% of men and 7.5% of women,

and 15.0% of men and 12.2% of women experienced considerable stress due to financial problems. Some 10.0% of men and 12.2% of women indicated a PCS as a significant stressor, and 8.7% of men and 7.1% of women reported concerns about separation from the Military. Increases in workload were highly stressful for 16.6% of men and for 15.9% of women. Some 13.0% of men and 12.8% of women found conflicts between military and family responsibilities to be a significant source of stress. About one in eight men (12.4%) and women (13.1%) found their relationships with their immediate supervisors to be highly stressful, and problems in relationships with co-workers were highly stressful for 12.4% of men and 15.7% of women.

Table 2

Specific Sources of Stress, Past 12 Months, by Gender, Total DoD

Stressor	Women	Men	DoD
Deployment	6.9	17.1	15.9
Having a PCS ^a	12.2	10.0	10.3
Work relationships	15.7	12.4	12.8
Problems with supervisor	13.1	12.4	12.5
Concern about separation from the military	7.1	8.7	8.5
Increases in workload	15.9	16.6	16.5
Being away from family	21.1	23.7	23.4
Changes in family	17.0	12.3	12.8
Conflicts between military and family responsibilities	12.8	13.0	13.0
Financial problems	12.2	15.0	14.6
Housing problems	7.5	7.6	7.6
Personal health problems	8.6	4.0	4.6
Family health problems	9.1	7.4	7.6

Note: Table entries are percentages of personnel who reported "a great deal" or a "fairly large amount" of stress in the past 12 months.

^aPCS = Permanent change of station.

Source: DoD Survey of Health Related Behaviors Among Military Personnel, 1995.

In spite of an overall trend for similar proportions of men and women to appraise specific circumstances at work and in their personal lives as highly stressful, there nonetheless appeared to be substantial variability by gender for several types of circumstances. Related to their military functioning, more men than women (17.1% vs. 6.9%) perceived deployment at sea or in the field to be a significant stressor. Women were more likely to indicate that major changes in family structure and functioning, such as the birth of a baby, a divorce, or a death in the family (17.0% for women vs. 12.3% for men), were significant stressors. In addition, women were twice as likely as men to indicate that personal health problems (8.6% for women vs. 4.0% for men) were a significant source of stress.

Approaches for Coping with Stress

Coping has been defined in terms of the strategies and processes that individuals use to modify adverse aspects of their environment, as well as to minimize internal distress induced by environmental demands (Lazarus, 1966; Moos & Billings, 1982). An important dimension of coping is the distinction between problem-focused coping strategies, defined as efforts to recognize, modify, or eliminate the impact of a stressor, and emotion-focused coping strategies, defined as efforts to regulate negative emotions that occur in reaction to a stressor event (Auerbach, 1989; Lazarus & Folkman, 1984). There is some empirical evidence that problem-focused or approach-oriented coping strategies that attempt to manage the problem are among the more effective ways to deal with stress, although the utility of any approach depends on the demands of the situation and the skill and flexibility of individuals in using various coping strategies.

We asked respondents to identify the types of strategies that they used to cope when they "feel pressured, stressed, depressed, or anxious." The list of response categories included items that tap approach and problem-oriented strategies ("think of plan to solve the problem"); emotion-focused strategies, such as seeking social support ("talk to friend or family member"); and avoidance coping ("have a drink," "smoke marijuana or use other illegal drugs," "think about hurting yourself or killing yourself"). Table 3 shows the percentage of personnel who commonly used specific coping strategies under conditions of stress, by gender for the total DoD.

As shown in Table 3, "think of plan to solve problems" was overwhelmingly indicated by military personnel as a "frequently" or "sometimes" implemented coping strategy (87.3%), followed by "talk to friends/family member" (71.9%) and "exercise or play sports" (63.0%). Across all Services, a solid majority of personnel often used these potentially effective problem-focused and approach-oriented coping strategies to deal with stress, daily pressures, and feelings of depression. With respect to generally less effective avoidant coping strategies, 47.0% indicated that they "get something to eat" when confronted with stress, 23.5% "have a drink," and less than 1% used illegal substances. Just over 4% of military personnel considered hurting themselves or committing suicide as a coping option for stress and/or depressive symptoms.

Table 3 also shows some potentially significant gender differences. Women were more likely to use social support as a coping strategy than were men (87.6% vs. 69.7%, respectively), but were less likely to turn to alcohol as a method of coping (16.8% for women vs. 24.4% for men). Women also reported a greater tendency than men toward using food substances as a method of coping with stress, anxiety, and depression (57.2% vs. 45.5%, respectively).

Substance Use and Stress

There are many strategies for coping with stress, a number of which were examined and discussed above. Data presented in Table 3 suggest that there may be a tendency for some military personnel to use alcohol, illicit drugs, and cigarettes as a coping mechanism for stress. To examine the relationship between substance use and stress in more detail, we conducted a series of logistic regression analyses predicting heavy alcohol use, illicit drug use, and cigarette smoking. Separate analyses were conducted for military women and men for each substance.

Table 3

Behaviors for Coping with Stress, by Gender, Total DoD

Coping Behavior	Women	Men	Total DoD
Talk to friend/family member	87.6	69.7	71.9
Light up a cigarette	24.0	26.7	26.4
Have a drink	16.8	24.4	23.5
Exercise or play sports	60.1	63.4	63.0
Get something to eat	57.2	45.5	47.0
Smoke marijuana/use illegal drugs	0.8	0.8	0.8
Think of plan to solve problem	89.3	87.1	87.3
Consider hurting or killing yourself	3.8	4.2	4.2

Note: Table entries are percentages of personnel who "frequently" or "sometimes" engage in a behavior when they feel pressured, stressed, depressed, or anxious.

Source: DoD Survey of Health Related Behaviors Among Military Personnel, 1995.

For alcohol, the probability of being a heavy drinker was used as the dependent measure. The dichotomous outcome measure was heavy drinking versus other drinking levels (excluding abstainers). For illicit drug use, the probability of using any illicit drugs during the past 12 months was used as the dependent measure. For cigarette use, the probability of smoking cigarettes in the past 30 days was the dependent measure. Both of the latter two measures were also dichotomous variables, and for all analyses results are expressed as odds ratios.

For these analyses, the measure of interest was the relationship of perceived stress to substance use (i.e., heavy alcohol use, any illicit drug use, cigarette use) after controlling for effects of other sociodemographic factors. Contrasts examined high versus low stress and moderate versus low stress. "High" stress was defined as persons who answered that they had experienced a great deal or fairly large amount of stress in the past 12 months; "moderate" stress was defined as persons who answered that they had experienced some or a little stress in the past 12 months; and "low" stress was defined as those who stated they experienced no stress in the past 12 months. Separate analyses were conducted for measures of stress at work, stress in the family, and stress associated with being a woman in the Military.

Sociodemographic factors included in the models were Service (Army, Navy, Marine Corps, Air Force) race/ethnicity (white, black, Hispanic, other), education (high school or less, some college, college graduate or higher), age (20 or younger, 21 to 25, 26 to 34, 35 or older), family status (not married, married with spouse not present, married with spouse present), pay grade (E1-E3, E4-E6, E7-E9, W1-W5, O1-O3, O4-O10), and duty location (stationed within CONUS or stationed OCONUS).

Table 4 shows the odds ratios for the types of stress (at work, in the family, being a woman in the Military) and levels of stress (high vs. low, moderate vs. low) from the logistic regression analyses for heavy alcohol use, illicit drug use, and cigarette smoking. For military women, results indicate a significant relationship between illicit drug use and cigarette use and stress associated with being a woman in the Military. Those who perceived high stress being a woman in the Military were over 1.5 times more likely than those with low stress to smoke cigarettes in the past 30 days and over 2.5 times more likely to use illicit drugs during the past 12 months. In contrast, military women showed no significant association between levels of stress at work or in the family and substance use.

For military men, results showed significant relationships between levels of stress at work and all three substances and between levels of stress in the family and illicit drug use and cigarette use. More specifically, military men who experienced high stress at work were nearly 1.4 times more likely to drink heavily, over 2.3 times more likely to use illicit drugs and 1.7 times more likely to smoke cigarettes than men with low stress at work. In addition, men who experienced high stress in their families or personal relationships were 1.8 times more likely to use illicit drugs and over 1.5 times more likely to smoke cigarettes than those with low stress.

Table 4*Perceived Stress and the Odds of Substance Use*

Gender/Stress	Heavy Alcohol Use Past 30 Days	Illicit Drug Use Past 12 Months	Cigarette Use Past 30 Days
Women			
Stress at work			
High vs. low	1.60	1.47	1.20
Moderate vs. low	1.74	.92	.99
Stress in family			
High vs. low	1.28	1.10	.86
Moderate vs. low	1.20	1.44	.6
Stress being a woman in military			
High vs. low	.97	2.54*	1.52**
Moderate vs. low	.70	1.99	1.29
Men			
Stress at work			
High vs. low	1.37**	2.32***	1.70***
Moderate vs. low	1.01	1.54	1.21*
Stress in family			
High vs. low	1.26	1.81***	1.53***
Moderate vs. low	1.02	1.31*	1.13

Note: Data are odds ratios of substance use adjusted for effects of military Service, race/ethnicity, education, age, family status, pay grade, and duty location. Sample sizes for women ranged from 2,031 to 2,966; for men, sample sizes ranged from 10,403 to 13,171.

*p<.05

**p<.01

***p<.001

Source: DoD Survey of Health Related Behaviors Among Military Personnel, 1995.

Discussion and Recommendations

Key Findings

Substance use--use of alcohol, illicit drugs, and cigarettes--decreased from 1980 to 1995 among military women and men. Decreases were particularly dramatic for illicit drug use during the past year, and levels of use were similar throughout the time period for women and men. Substantial decreases in cigarette smoking during the past 30 days also were found for military women and men; likewise, levels of use for women and men were similar across the time period. Heavy alcohol use during the past 30 days also decreased for both women and men, but the decrease was more gradual; throughout the period, rates of heavy drinking among men were two to three times those among women. Despite these decreases, rates of heavy alcohol use and smoking remained relatively high. Illicit drug use was less common.

Substance use is often considered to be a means of coping with and reducing stress (McFall et al., 1992), although research shows that the nature of this relationship is more complex than once thought (Brunswick, Lewis, & Messeri, 1992; Martin, Blum, & Roman, 1992). Clearly, as shown here, many military personnel experience high levels of stress associated with military work or family life. Military personnel may be in endangered situations or far away from home and family. They may also experience the same types of stressors in their work and family lives as do nonmilitary personnel. Problems with finances may also contribute to stress. Military personnel reported higher levels of stress associated with their work than with their family life overall. However, separation from family was mentioned most frequently by both women and men as the leading source of high stress. This finding is consistent with the fact that work and family are closely intertwined in the Military. Many military women also reported high levels of stress simply because of their status as women in a predominantly male workforce.

In our regression analyses, the strongest associations between substance use and stress were found for military men. Military men who experienced high levels of stress at work were more likely than those reporting low stress to be heavy alcohol users, illicit drug users, or smokers. Those experiencing high levels of stress in family life were more likely than those reporting low stress to use illicit drugs or to smoke. Among military women, use of alcohol, illicit drugs, and cigarettes were not related to levels of stress at work or in the family. Military women experiencing high levels of stress associated with being a woman in the Military were, on the other hand, significantly more likely than those under low levels of stress to report illicit drug use or cigarette use. Notably, heavy alcohol use among women was unrelated to any type of stress. This finding for military women is consistent with research in general population studies of women that have found little evidence for an association between life events and alcohol consumption (Cook & Allan, 1984).

These findings suggest that military women did not turn to substance use to cope with high or moderate levels of stress in their military work or in their family and personal relationships. However, those who experienced high stress associated with being a

woman in the Military were more likely than those who did not feel such stress to use drugs and to smoke cigarettes. In contrast, men who were experiencing high stress at work and in family life were more likely than those experiencing low stress to be substance users.

The findings from regression analyses are consistent with observations of coping strategies reported by military women and men. Military women reported being less likely than military men to smoke cigarettes or take a drink when they felt stressed. Very few military women or men reported using illicit drugs to cope with stress. Almost 90% of military women and men tried to think of a plan to cope with stress, while military women were much more likely than military men to talk with friends or family members. This is an encouraging finding in that the extant research literature suggests that coping styles aimed at managing problems through direct action of seeking social support are generally more effective than coping strategies that attempt to ignore or avoid the problem (Aldwin, 1993). Military women were less likely than military men to use alcohol or cigarettes in response to stress. Military women were also somewhat more likely than military men to report "getting something to eat" as a coping strategy.

Implications

These findings suggest that stress is an important predictor of substance use among military men but less so among military women. For military women, substance use is primarily associated with stress experienced as a woman in the Military. These findings also suggest the need to target stress reduction and substance use prevention programs differentially for military women and men. Not only do stressors and coping mechanisms differ for women and men, but factors related to substance use may also differ. Because Military women report experiencing work-related stress from being a woman in the military, however, the nature of the work situation for particular occupations should be investigated. Such stress may be related to the fact that women are a minority in a predominantly male workforce or may emerge from other sources within the work group.

These findings also suggest that substance use among military women is associated with factors other than stress, a finding that should guide the development of substance use prevention and education efforts for women. The similarity of rates of illicit drug use and cigarette smoking among military women and men contrasts with the typically higher rates of use among men found in many civilian studies (e.g., SAMHSA, 1995). The substantially higher rates of heavy drinking among military men compared with military women, however, mirrors gender differences found in other studies (Bray et al., 1995b; Bray, Marsden, & Peterson, 1991; Clark & Hilton, 1991; SAMHSA, 1995). Additional analyses should consider the factors related to substance use among military women and the distinctiveness of patterns of substance use among military women relative to military men and civilian women. Prior analyses have suggested that the substance use patterns of military women more closely approximate the substance use patterns of military men than of civilian women (Bray et al., 1991). The determinants of substance use among military women may differ from those found in civilian studies.

Recommendations for Further Research

The current study identifies a number of issues and questions in need of further study to more fully understand the relationship of substance use and stress. More research is needed to understand the nature of stressors military women and men face, the level of those stressors, when and how they relate to substance use, and how they affect work performance. Stress appears to be more strongly related to substance use among military men than military women, although under some conditions stress among military women may also result in substance use. These findings also suggest the need for additional research on the determinants of substance use among military women, their distinctiveness from military men and civilian women, and the nature of stressors in the workplace encountered by military women. Detailed studies of the nature of work groups and occupations engaged in by military women and men, the nature of male and female interactions in the workplace, and specific stressors will inform these questions.

In addition, research should examine the nature of family-related stressors experienced by military personnel and more effective means of addressing these stressors. Research could also examine the relationship between stress and one type of illicit drug use among military women--psychotherapeutic drug use. Although no specific relationship between stress and illicit drug use more generally was found for military women, stress may be related to psychotherapeutic drug use specifically.

This research could be used to inform the design of more effective stress management and substance abuse prevention programs that take into account the specific needs of military women and men. Findings reported here suggest the need to develop different programs for military women and men.

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**Anorexia and Bulimia Nervosa:
An Overview**

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In recent years, increasing attention has been devoted to recognition of eating disorders as significant health issues for women. The term *eating disorder* encompasses a variety of psychological disorders involving disturbed eating patterns. Related aspects include unhealthy weight control practices, body image distortion or disparagement, impaired interpersonal functioning, psychiatric comorbidity, and negative medical side-effects. The focus of this report will be to provide an overview of diagnosis, epidemiology, medical complications, clinical characteristics, detection, and treatment strategies for the most commonly recognized and most extensively studied eating disorders, anorexia nervosa and bulimia nervosa. Attention will also be devoted to a more recently recognized syndrome, binge eating disorder. The relevance and implications for female military personnel will also be addressed briefly.

Diagnostic Criteria

Although the symptoms of the various eating disorder syndromes overlap considerably and are often characterized as lying on a continuum, classification of specific eating disorders is based on criteria outlined in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)*; American Psychiatric Association, 1994).

Anorexia Nervosa. The primary distinguishing feature of anorexia nervosa (AN) is the inability to maintain a minimally normal body weight (i.e., at least 85% of expected body weight considering age and height). Individuals with AN exhibit intense fear of gaining weight, despite their excessively low weight status. Individuals with AN experience their body weight or shape in a distorted manner (e.g., size distortion) and indicate after intense body image disparagement. Evaluation of self is unduly influenced by body weight or shape, which is often the primary determinant of self-esteem. Amenorrhea (specifically absence of three or more consecutive menstrual cycles) is also required for a diagnosis of AN. Perhaps the feature that presents the greatest challenge in accurately assessing and effectively treating this disorder is the adamant denial of the seriousness of maintaining an excessively low body weight. Individuals with AN may also exhibit recurrent symptoms of binge eating and purging (i.e., self-induced vomiting or abuse of laxatives or diuretics), which is classified as the binge eating/purging subtype of AN. Absence of recurrent binge eating and purging characterizes the restricting type of AN.

Bulimia Nervosa. Bulimia nervosa (BN) has been recognized as a distinct clinical disorder for only the past two decades (Russell, 1979). Symptoms of BN include recurrent binge eating (i.e., eating large amounts of food in a short time period accompanied by a sense of loss of control) followed by methods of inappropriate compensation. Compensatory methods include purging (i.e., self-induced vomiting or abuse of laxatives or diuretics), fasting, or excessive exercise. To meet diagnostic criteria for BN, the binge eating and compensatory behavior(s) must occur (on average) at least twice a week for a three-month period. An additional criteria for BN is perception of body shape and weight unduly influencing self-evaluation. A diagnosis of BN is not given to individuals who also meet criteria for AN. Subclassification of BN is based on type of recurrent compensatory methods, referred to as purging and nonpurging types.

Binge Eating Disorder. Despite the fact that problems associated with recurrent binge eating have been cited in scientific obesity literature for almost four decades (Stunkard, 1959), only in the past few years has this disorder begun to receive much attention. Although not officially recognized in *DSM-IV* as an eating disorder, binge eating disorder (BED) has been included as an example of an eating disorders-not otherwise specified (EDNOS). Similar to the criteria for BN, the diagnosis of BED includes recurrent binge eating. However, individuals with BED do not engage in the regular use of inappropriate compensatory behaviors. Binge eating episodes, occurring on average at least two days a week for a period of six months, are associated with marked distress. Additional criteria include at least three of the following: rapid eating; eating until uncomfortably full; eating large amounts when not physically hungry; solitary eating due to embarrassment about the amount eaten; or feelings of disgust, depression, or guilt after overeating. A diagnosis of BED is not given if an individual meets diagnostic criteria for AN or BN.

Epidemiology

Although increased recognition of eating disorder problems in women has contributed to the perception that eating disorders have become an "epidemic," this is not supported by epidemiological research (see Hoek, 1996). However, the high prevalence of eating disorders is well documented, with women representing the majority of those afflicted. Research on AN and BN indicates that these disorders are most often found among Caucasian adolescents and young adult women in industrialized countries espousing Western ideology. The most recent figures indicate that from .10% to 1.0% of young females have AN (see APA, 1994; Walters & Kendler, 1995). Prevalence rates are higher for BN, ranging from 1% to 3% of young women when using stringent diagnostic criteria (see APA, 1994; Drevnowski, Yee, & Krahn, 1988; Schotte & Stunkard, 1987). Although these disorders are most commonly seen in women, approximately 5% to 10% of individuals who develop AN or BN are men (see Hoek, 1995).

The emergence of BED as a recognized clinical entity has created the need to modify established conceptualizations of prevalence and epidemiology of eating disorders. In community samples, rates of BED generally are higher than those reported for AN or BN, ranging from 1% to 5% (Spitzer et al., 1992, 1993; Brewerton, Dansky, O'Neil, & Kilpatrick, 1993). However, approximately one-third of individuals seeking weight loss treatment meet criteria for BED (Spitzer et al., 1992, 1993). Based on both clinical and community samples, the majority of individuals with BED are women; however, a relatively large proportion of men also meet criteria for BED (see Yanovski, 1993). Furthermore, risk to ethnic minorities of developing binge eating problems or BED appears to be comparable to that of Caucasians in most (Spitzer et al., 1991; Gormally, Black, Daston, & Rardin, 1982; Kolotkin, Revis, Kirkley, & Janick, 1987), but not all studies (Brody, Walsh, & Davlin, 1994).

Increased rates of AN and BN have been associated with certain professions (e.g., fashion models, ballet dancers) that emphasize thinness. Elevated rates of eating disorders have also been found among individuals involved in competitive athletics (Anderson, Bartlett, Morgan, & Brownell, 1995; McDonald & Thompson, 1992; Pasman & Thompson, 1988; Sykora, Grilo, Wilfley, & Brownell, 1993), particularly those in which maintenance of a low body weight is competitively advantageous (e.g., gymnastics, running, wrestling). It is possible that participation in such activities poses a risk factor in the development of an eating disorder. Alternatively, some individuals with established eating disorders (or body image disparagement) may be drawn to such activities. Compulsive exercise provides a socially condoned means to achieve or maintain a low body weight.

Sequelae and Complications of Eating Disorders

Medical complications. Detailed accounts of adverse medical sequelae of eating disorders are beyond the scope of this report, although several reviews are available (see Mitchell, 1996; Pomeroy, 1996; Sharp & Freeman, 1993). Although prevalence rates for AN are low, the medical consequences can be grave. Mortality rates for AN range from 6% to 20% (Crisp et al., 1992; Ratnasuriya et al., 1991) and up to 25% of anorectic individuals develop severe, chronic disabilities resulting from the disorder (Beumont et al., 1993). The results of prolonged malnutrition found in AN includes certain visibly recognizable symptoms including obvious weight loss, dry hair and skin, alopecia (i.e., hair loss), and excessive lanugo hair (e.g., fine, downy body hair). Cold intolerance, sleep disturbances, headaches, and fatigue are common among individuals with AN. Prolonged protein depletion resulting from chronic malnutrition results in additional symptoms, detectable through laboratory examinations. Abdominal pain and bloating, and constipation are often reported by individuals with AN, which may be due to delayed gastric emptying. Constipation also may result from laxative abuse and starvation. Among the most serious consequences of AN are osteoporosis, growth stunting, and cardiac complications.

Although mortality rates for BN are low, fatalities have been documented as a result of gastric rupture after binge eating, esophageal perforations (i.e., Boerhaaves syndrome), and cardiomyopathy due to chronic ingestion of Ipecac®. Fluid loss due to recurrent purging can result in dehydration and electrolyte imbalance, potentially leading to cardiovascular disturbances. Recurrent vomiting may result in esophageal erosion. Constipation and abdominal bloating and pain may result from eating excessive amounts of laxatives.

Fatality resulting specifically from binge eating behavior is uncommon. However, a high mortality is associated with obesity, which may develop as a consequence of chronic binge eating. Medical complications of obesity include myocardial infarction, adult onset diabetes mellitus, hypertension, stroke, gallstones, osteoarthritis, and certain types of cancer.

Psychological and social impairment. Increased psychological distress (i.e., symptoms of depression and anxiety) is often found among individuals with an eating disorder. Furthermore, relatively high rates of comorbid psychopathology (especially affective disorders) have been documented for individuals with AN, BN, and BED. In addition, problems with past or present substance abuse are not uncommon in individuals with eating disorders. Body image disparagement and size estimation distortion also characterize these individuals. Marked fluctuations in these psychological symptoms frequently occur; these may precipitate or result from intensified eating disordered behavior. These symptoms often covary with degree of depressive symptomatology, although the causal nature of this relationship has not been determined. Individuals with eating disorders often, although not always, report decreased levels of self-esteem and disturbances in social functioning. Social isolation is particularly problematic.

The extent to which these psychological and social difficulties may be involved to in the development of eating disorders remains unclear and could be clarified by prospective, longitudinal studies. However, it is important to note that many of these symptoms are ameliorated with treatment that results in reduction or cessation of eating disordered behaviors.

Detection and Assessment

Several factors contribute to the secretive nature of eating disorders, including denial of the seriousness of symptoms, embarrassment regarding the symptoms, and/or fear of the consequences of relinquishing the disturbed behaviors (i.e., potential weight gain). Consequently, eating disorders among women often go unnoticed and can be challenging to assess, although warning signs are often present. Secretive eating, refusal to eat in public, and frequent dieting may be indicative that an individual is struggling with some form of an eating disorder; these symptoms are often found in women with AN, BN, and BED. Behavioral indications of purging behavior include spending excessive amounts of time in bathrooms or frequently going to bathroom immediately following eating. Excessive or compulsive physical activity may also indicate the use of exercising as a form of dietary compensation. The use of stringent diets or fasting for extended periods may signal the presence of an eating disorder. Substantial changes in body weight, including weight fluctuations, or continued weight gain or loss may also be indicative of an eating disorder.

Emaciation is usually the primary physical indication of AN. Measurements of body weight obviously aids in determining if an individual is below 85% of expected weight; however, individuals with AN may drink excessive amounts of fluid or wear concealed weights in an attempt to manipulate assessment of body weight. Overactivity (e.g., continuous body movement or pacing) is often observed among individuals with AN. As described above, some of the additional detectable signs of AN include dry skin and hair, increased lanugo, or alopecia. Amenorrhea may also indicate the possibility of AN, although the use of oral contraceptives may complicate the detection of this symptom.

Although frequent weight fluctuations may signal the presence of BN, many individuals with BN are of normal weight and appear relatively healthy. Although BN may be less easily detected than AN, certain signs may aid in its detection. One indication of recurrent self-induced vomiting, sometimes referred to as a "Russell's sign" (Russell, 1979), is the development of callouses or scarring on the back of the hand resulting from abrasion during self-induced vomiting (Mitchell, Seim, Colon, & Pomeroy, 1987). This symptom may not be present in those individuals who use primarily alternative forms of purging (i.e., laxative, diuretic, or enema abuse), who have nonpurging BN, or who after prolonged vomiting have come to do so reflexively. Self-induced vomiting may also contribute to hypertrophy of the salivary glands (Buchanan & Fortune, 1994), creating a swollen appearance of the neck and face (i.e., "puffy cheeks"). Although this symptom may be fairly pronounced in some women, it is not detectable in the majority of individuals with BN. Additional signs include the presence of small skin hemorrhages (i.e., facial petechiae) or conjunctival hemorrhages that may be result from forceful vomiting. Dental enamel erosion, most pronounced on the inside surface of the upper teeth, is another indication of purging that may produce protrusion of dental fillings or discoloration (i.e., darkening) of the teeth. This symptom, which is easily detected during dental examinations, may be overlooked during routine physical examinations unless assessed specifically. Edema may be present for those who abuse laxatives or diuretics. Individuals with BN often complain of "bloating," constipation, or lethargy. Laboratory tests may be used to detect electrolyte imbalance, although such abnormalities are detected in only approximately 40% of individuals with BN.

Although more prevalent than AN or BN, BED is possibly more difficult to detect, given the lack of physical indicators of this disorder. Although weight gain and obesity are commonly found among many individuals seeking treatment for BED (Mussell et al., 1995), it is important to note that the majority of individuals who are overweight do not experience problems with binge eating. Furthermore, many women with BED report that the problems with binge eating developed in the absence of being overweight and that the onset of obesity developed several years after a pattern of binge eating had been established (Mussell et al., 1995). Although not indicative of an eating disorder, requests for dietary information or weight loss treatment may be clues to recurrent binge eating.

Treatment

Psychotherapy. Psychotherapy is commonly used in the treatment of all types of eating disorders. One form of psychotherapeutic intervention, cognitive behavioral therapy (CBT) has been the most extensively studied. CBT is a time-limited, present-focused, solution-oriented type of therapy. As applied to eating disorders, the primary focus is on modifying disordered eating behaviors and distorted cognitions about food, weight, and shape. The effectiveness of CBT has been demonstrated in several studies of BN (see Wilson, Fairburn, & Agras, in press), and a few recent studies of recurrent binge eating or BED (Telch, Agras, Rossiter, Wilfley, & Kenardy, 1990; Wilfley et al., 1993; Agras et al., 1995). Improvements have been reported for binge eating symptoms, general

psychological functioning, and attitudes toward weight and shape. An alternative type of psychotherapy, interpersonal psychotherapy, recently has been demonstrated to be effective in treating individuals with BN (Fairburn et al., 1991; Fairburn et al., 1993) and BED (Wilfley et al., 1993). Similar to cognitive behavioral therapy, interpersonal therapy is time-limited, present-focused, and solution-oriented; however, emphasis in this type of treatment is on modification of interpersonal interactions.

Although AN has received attention from clinical researchers for several decades, little empirical data are available regarding efficacy of any form of treatment. Only four outpatient psychotherapy studies of AN have been reported to date, with some suggestions of effectiveness (see Pike, Loeb, & Vitousek, 1996). The use behavioral modification programs (which overlap to a certain extent with CBT interventions) during inpatient hospitalization has received support in several studies (see Pike, Loeb, & Vitousek, 1996)

Medication. Little empirical data are available on the benefits of pharmacotherapy in promoting weight restoration in individuals with AN. Approximately a dozen controlled trials have been conducted on a variety of medications, yielding often ambiguous results (see Crow & Mitchell, 1996, for a review). Benefits have been demonstrated for the use of amitriptyline in one study and for cyproheptadine in two studies. However, the majority of placebo-controlled studies, including the use of tricyclic antidepressants, cyproheptadine, antipsychotics, clonidine, cisapride, lithium, or tetrahydrocannabinol, have not demonstrated efficacy in promoting weight restoration.

Antidepressant medications have been demonstrated to be effective in reducing binge eating and purging symptoms in several BN studies (see reviews by Crow & Mitchell, 1996; Garner & Needleman, 1996; Mitchell et al., 1993; Raymond, Mitchell, Fallon, & Katzman, 1994). Four of five trials have demonstrated the superiority of serotonin-reuptake inhibitors in comparison to placebo in reducing bulimic symptoms. These medications have generally been found to be well-tolerated. Therefore, the first choice for treatment using medication for BN is arguably fluoxetine hydrochloride (Prozac) at daily doses of 60 mg (higher than the recommended dose of 20 mg used to treat individuals with major depressive disorder). The use of tricyclic antidepressants or monoamine oxidase inhibitors is also supported by research, although the side-effects of these classes of medications may be less desirable than the serotonin-reuptake inhibitors. However, they may be beneficial treatment strategies for those individuals who do not respond to serotonin-reuptake inhibitors.

Despite the relative efficacy of antidepressant medications compared to placebo in reducing bulimic symptoms, it is important to note that rates of symptom remission at end of treatment, ranging from 4% to 20% in most studies (see Crow & Mitchell, 1996), are generally lower than those reported in psychotherapy outcome studies. Although augmenting psychotherapy with pharmacotherapy may seem indicated in some cases, three studies have reported no benefit to adding antidepressant treatment to psychotherapy (Mitchell et al., 1990; Fichter et al., 1991; Goldbloom, Olmsted, Davis, & Shaw, 1994). However, the results are equivocal in one study (Agras et al., 1992), and it has been suggested that certain other symptoms, such as depression, may benefit from the combination of treatments.

Nutritional counseling. Nutritional counseling is a necessary component of treatment of individuals with eating disorders. Healthy meal planning is the cornerstone of this approach, which involves providing nutritional information about the types and amounts of food necessary to achieve or maintain adequate nutrition and healthy weight. Behavioral strategies are also employed to increase the likelihood of successfully adhering to nutritional recommendations. Nutritional counseling is essential for the treatment of AN, which requires an increase in caloric intake to promote gradual weight restoration at a rate of 1 to 3 pounds per week. Nutritional counseling is also useful for treating BN and BED to help stabilize the dietary chaos that often promotes binge eating.

Hospitalization. Inpatient hospitalization is required if sufficient medical danger exists (e.g., cardiac arrhythmia, severe electrolyte imbalance, gastrointestinal bleeding, suicidal ideation). Goals of hospitalization include interruption of weight loss (usually if less than 70-75% ideal body weight), restoration of healthy body weight, cessation of binge eating or vomiting, treatment of medical complications, and treatment of comorbid conditions (e.g., depression or substance abuse). Hospitalization may also be indicated if sufficient clinical benefits are not derived from outpatient therapy.

Day treatment may be recommended following inpatient discharge or as an alternative to hospitalization. This type of treatment allows patients to obtain therapeutic services at the hospital during the day without needing to stay overnight, and is more economical than hospitalization. Additional benefits of this type of treatment include allowing the patient to pursue work or education while obtaining intensive treatment, and providing a structured atmosphere during meal times.

Implications Concerning Health Issues for Women in the Military

Although using stringent diagnostic criteria the prevalence for any single eating disorder is rather low, 5 to 10% of women may be afflicted with one of the three diagnosable eating disorders (i.e., AN, BN, or BED). Serious medical, psychological, and social consequences are associated with these disorders. Eating disorders clearly present significant physical and mental health concerns for women. To our knowledge, no data have been reported on prevalence rates of eating disorders among military personnel. Pending future research, we can only speculate that prevalence rates among women in the armed forces do not differ significantly from rates found for the general female population. Furthermore, certain risk factors for eating disorders may be associated with military participation.

Current or historical problems with an eating disorder may be concealed during evaluation for admission to the military due to concerns about the ramifications of disclosing the information. Due to the often chronic and recurrent course of eating disorders, symptoms may recur or be exacerbated, especially during periods of perceived increased stress. Increased rates of eating disorders have been well documented among women who participate in strenuous athletic activities, especially those that emphasize maintenance of a lean body (see Brownell, 1996, for a review). Many women with eating disorders select arduous physical activities (e.g., marathon running) as a method of

compensating for disordered eating or alleviating concerns about body shape and weight. Unlike other methods of dietary compensation (e.g., purging), "compulsive" exercising may be socially sanctioned and overlooked as a potential symptom of a serious problem. It is unclear to what extent the demanding physical training associated with enlistment in certain military specialties, or the pressure to maintain physical fitness, may be related to the development or recurrence of eating disorders. Additionally, it is possible that personality characteristics such as perfectionism (i.e., having extremely high, rigid personal standards), associated with both athletes and individuals with eating disorders, may also be characteristic of those volunteering to undergo the rigors of military training and service.

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An Overview of Eating Disorders

Prevalence of Eating Disorders in the Military

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Recent changes within the Department of Defense (DOD) regarding the role of women in the military have created opportunities for them to serve in positions previously open only to men. Only anecdotal information is available describing potential health effects of these assignments on women. Review of the literature reveals only one study of the prevalence of eating disorders; that study was conducted on a sample of subjects from the Israeli defense force (Scheinberg et al., 1992). Whereas there has been a proliferation of research on eating disorders, no such research has been conducted with a military population, as evidenced by a report compiled from military medical treatment facilities from 1973 to the present (Naval Information Management Center, 1994).

In 1990, Fairburn and Beglin noted that more than 50 prevalence studies had been conducted (Fairburn & Beglin, 1990). In such studies, estimates of the frequency of bulimia nervosa varied widely, depending on the methodology used. The variability can be focused on several factors: (a) variation in methods of sampling (e.g., college students as subjects, medical practices, and media surveys); (b) response rates varied greatly, and bias was likely, given that bulimics tend to avoid including themselves; and (c) case detection varied--rates determined from questionnaires are thought to be three times as high as those determined by interview. Because of these differences in methodologies, reported prevalence rates in studies from the 1980s reported as much as a 20-fold difference. The two most rigorous studies to date have reported lifetime prevalence rates of 2.8% and 1.6% for female subjects (Bushnell, Wells, Hornblow, Oakley-Browne, & Joyce, 1990; Kendler et al., 1991). There is agreement from a number of studies that eating disorders may occur in as many as 1% to 4% of female high school and college students. They may occur in as many as 12%–15% of female medical and other graduate students. Suspected cases of clinical eating disorders or subclinical variants are even more common among groups exposed to heightened pressures to diet or maintain a thin shape (Garner, 1991).

Women in the military would be considered a group exposed to heightened pressures to maintain physical fitness and military bearing in a uniform. Military women, particularly those at the service academies, may be most analogous to female athletes. A growing body of evidence suggests that the prevalence is increasing of eating disorders and excessive concerns regarding body weight in female athletes. Studies have shown that athletes are more prone to developing eating disorders than are nonathletes (Burckes-Miller & Black, 1988; Pasman & Thompson, 1988; Sundgot-Borgen, 1993).

In 1995, an epidemiological study was undertaken at the United States Naval Academy on eating disorders and disordered eating among midshipmen, i.e., students. The 1995 student body of 4,100, with the incoming class of 1999, provided the basis for a cross-sectional as well as a longitudinal study. The Eating Disorders Inventory (EDI-2) had established reliability and validity for use among age- and sex-equivalent college populations (Garner, 1991). Disordered eating and eating disorders were known to occur among midshipmen. The military services and service academies do not have objective data about the scope of the problem. In an analogous group (i.e., athletes), where performance under a structured training schedule is required, there is a need to control body weight and fat, and there is the psychological stress of competition, the prevalence of eating disorder is as high as 25% (Thorton, 1990). Research on disordered eating among female and male midshipmen is necessary for the development of a scientific data base from which rational policy can be formulated and effective intervention programs designed.

In May 1995, the EDI-2 was administered to 2700 male and 400 female midshipmen from the United States Naval Academy classes of 1995, 1996, 1997, and 1998. In July of 1995, 820 males and 179 females from the class of 1999 responded anonymously. To insure confidentiality, average data are reported. Individuals measuring at or above the 90th percentile on the Drive for Thinness and Bulimia subscales were considered to be at risk for eating disorders and were likely to be engaging in disordered eating behaviors. The survey in May 1995 revealed that 9.6% of the females and 2.8% of the males reported symptoms associated with disordered eating behaviors. The incoming class of 1999 reported a rate of 5.6% for females and 1.9% for males.

This study suggests that the prevalence rate for this military subpopulation is less than the highest levels of college athletes. It is, however, inconclusive without clinical interviews (for diagnostic evidence) to know the exact prevalence rate.

In response to these findings, the Academy has instituted a primary prevention program to educate newly arriving midshipmen about the hazards and warning signs for developing eating disorders in themselves or fellow classmates. A secondary prevention program was initiated to educate the student body about eating disorders and to implement intervention strategies for individuals who were suffering from an eating disorder. Individual and group therapy for those diagnosed with an eating disorder using clinical interviews comprised another component of the program.

With a desire to perform well in their new roles in the military, coupled with a desire to improve their appearance because of weight standards, military women may engage in restrictive eating or obsessive weight control behavior. Future research should seek to ascertain the prevalence of eating disorders in the military and identify those women at risk.

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Women's Responses To Gruesomeness

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Gruesomeness as a Traumatic Stimulus

One of the common features of disasters is the exposure of victims, rescue workers, and volunteer helpers to the dead. Often these dead have been burned, dismembered, or mutilated in ways that are described as gruesome. While such exposures are only part of the experience of disasters, their role in producing distress has been well documented (Green, Lindy, Grace, & Gleaser, 1989; Jones, 1985; Ursano & McCarroll, 1990). There is very little scientific literature on the effects of disasters on women and even less on the components of disasters, such as the exposure to gruesomeness, that affect either men or women. The questions to be explored here are the nature of women's responses to exposures to gruesomeness, and whether and under what conditions their responses might be different from those of men.

The studies of disasters that have included comparisons of men and women have not provided definite conclusions about the prevalence or duration of symptoms. In reviewing the literature on disasters and their mental health effects, Green (1993) has suggested that based on simple counts, women may appear to be at higher risk for psychiatric disorders following disasters, but the effects are not consistent. Risk may vary with the type of outcome observed, and the sexes may express their distress in different ways.

Anticipated Stress of Exposures to Gruesomeness

The periods in which disaster victims or rescuers might be expected to show distress can be divided into the time before the event, during it, and afterward. It has been shown that the period of time before an event can also be stressful based on certain aspects of the stress than is anticipated to occur. For example, when individuals know that they must undergo a stressful event, there is a period of waiting between learning of the event and actual participation in it. This period could be a matter of moments or much longer, days or weeks, depending on the circumstances. During this time, heightened arousal or an actual stress response may occur. Such "anticipated stress" has been reported in fire fighters (Ersland, Weisaeth, & Sund, 1989) and novice parachute jumpers (Fenz & Epstein, 1967). People may wonder if they will perform their duties well (which is sometimes expressed as "Can I take it?"). Others may anticipate the distress and discomfort associated with unpleasant sights, sounds, and smells of disaster (Ursano & McCarroll, 1990).

Fear of mutilation. A number of investigators have provided evidence that women have higher levels of fear than men related to the sight of mutilation, blood, and injuries. Klorman, Weerts, Hastings, Melamed, & Lang (1974) described the development of a measure of the specific fear of mutilation in men and women via 30 true-false items called the Mutilation Questionnaire (MQ), based on Bandura's (1969) research on the modification of fear through procedures derived from learning principles. The scale has consistent psychometric characteristics across samples and evidence for discriminant validity was presented. The investigators proposed that this scale would be useful in understanding the verbal-cognitive component of fear. Kleinknecht and Thorndike (1990)

examined the ability of the MQ to predict blood and injury-related fainting, a response common to many blood and injury-fearful persons. Factor analysis of the MQ revealed two factors described as revulsion of blood and injury stimuli, accounting for 19% of item variance, and fear of bodily damage, accounting for 7%.

McCarroll, Ursano, Ventis, Fullerton, Oates, Friedman, Shean, and Wright (1993) studied the anticipated stress of handling the dead in groups of men and women with and without such prior experience. A total of 583 military volunteers, 471 men and 112 women, were asked to rate the anticipated stress of handling remains in 13 situations. The situations to be rated included: (a) handling bodies that had been mutilated (burned, decomposed, in parts), (b) handling the bodies of persons of varying degrees of relation to the handler (known, friend, child, opposite sex), and (c) three contexts of body recovery under battlefield conditions. This latter category implied some risk to the body handler from battlefield situations such as performing their duties while under hostile fire. Anticipated stress was rated on a scale of 0 to 100 where 0 was no stress and 100 was the worst the person could imagine.

Eighty-seven men had previous experience handling remains, 384 men had none. Seventeen women were experienced and 95 were inexperienced. In a second study, anticipated stress was measured in college students, 199 subjects (100 males and 99 females). In a third study, a subgroup of subjects of study 1, subjects rated the anticipated stress they thought they would feel if they had to handle a body that was depicted in slides of various types of traumatic death. The inexperienced group rated all 13 items; their anticipated stress score was the mean of these 13. The experienced group was composed of all individuals who had performed at least one of the 13 tasks. Their anticipated stress score was the mean of the situations not performed (between 1 and 12 per person, depending on the number of situations they had encountered).

Table 1

Anticipated Stress of Handling the Dead: Effects of Sex and Experience

	Mean	Standard Deviation
Inexperienced women	77.44	19.72
Inexperienced men	60.93	24.58
Inexperienced women	77.44*	19.72
Experienced women	57.84	28.59
Inexperienced men***	60.93	24.58
Experienced men	51.05	27.92
Experienced women	57.84	28.59
Experienced men	51.04	27.92

It was found that inexperienced women had higher anticipated stress scores than inexperienced men, $t=6.88$, $n=466$, $p<.001$ (see Table 1). When inexperienced and experienced women and men were compared (same sex), the inexperienced persons had higher anticipated stress scores than the experienced persons. When experienced women and men were compared to each other, the differences were no longer significant.

Thus, while female sex was initially a risk factor for higher levels of stress, when *experienced* women rated anticipated stress, their ratings were not significantly different from those of the experienced men. These studies showed an important difference between women and men that was apparently overcome when the effect of experience was considered. It is likely that a similar reduction in anticipated stress would be obtained if women and men were provided training in handling remains or in other disaster scenarios. It is still important, however, to attempt to discover if sex-specific differences in anticipated stress occur and to tailor training programs accordingly.

Anticipated stress was studied prior to the arrival of remains in 493 mortuary workers (403 men and 93 women) who operated a military mortuary that received American casualties during the Persian Gulf War of 1991 (McCarroll, Ursano, Fullerton, & Lundy, 1993). This group was further divided for analytic purposes into persons who anticipated handling remains and support workers (food service personnel and military police). Regardless of the duty to which an individual might be assigned, women had significantly higher MQ scores than men, $t=2.26$, $df=99.7$, $p<.05$ (Table 2).

Table 2

Mutilation Questionnaire Scores of Mortuary and Support Workers: Effect of Sex

	Mean	Standard Deviation	<i>n</i>
Women	8.04	5.74	78
Men	6.48	4.74	380

When the two groups, those who anticipated handling remains and those who did not, were analyzed separately, women who anticipated working in the mortuary had significantly higher MQ scores than the men, $t=2.18$, $df=373$, $p<.05$ (see Table 3). The women who anticipated working in the support group had higher MQ scores than the men, but they were not statistically different, due to the small size of the groups (Table 4).

Table 3*Mutilation Questionnaire Scores of Mortuary Workers: Effect of Sex*

	Mean	Standard Deviation	<i>n</i>
Women	8.06	5.82	58
Men	6.50	4.84	332

Table 4*Mutilation Questionnaire Scores of Support Workers: Effect of Sex*

	Mean	Standard Deviation	<i>n</i>
Inexperienced women	7.99	5.62	20
Inexperienced men	6.37	4.2	63

When the effect of prior experience of handling the dead was examined in the total group (those who anticipated handling remains and those who did not), inexperienced women had significantly higher MQ scores than inexperienced men, $t=2.16$, $df=78.2$, $p<.05$ (Table 5). When the experienced women and men were compared, there was no significant difference between the MQ scores of the two groups.

Table 5

*Mutilation Questionnaire Scores of Mortuary and Support Workers:
Effects of Experience*

	Mean	Standard Deviation	<i>n</i>
Experienced women	8.99	6.11	59
Experienced men	7.14	4.88	228
Experienced women	5.10	2.86	19
Experienced men	5.49	4.34	152

When the effect of experience was examined among the women and the men in the mortuary group only, the same differences were found as those within the total group. Inexperienced women had significantly higher MQ scores than the men, $t=2.12$, $df=226$, $p<.05$ (Table 6). In the experienced group of mortuary workers, the difference in the MQ scores of the women and men was not significant, although there was a trend for the men's scores to be higher than those of women.

Table 6

Mutilation Questionnaire Scores of Inexperienced Mortuary Workers: Effects of Sex

	Mean	Standard Deviation	<i>n</i>
Inexperienced women	9.19	6.30	42
Inexperienced men	7.27	5.07	186
Experienced women	5.10	2.69	16
Experienced men	5.41	4.30	131

Psychiatric symptoms. Mortuary workers had higher levels of anticipated stress than support workers on the Brief Symptom Inventory (BSI), a measure of general psychiatric distress (Derogotis & Melisaratos, 1983). The scores of the mortuary workers and the support workers were similar for men and women, but non-volunteers had higher levels of stress than volunteers. When male and female volunteers and non-volunteers were compared on the BSI, the female mortuary workers had higher scores than men for the depression, anxiety, and somatization subscales. Intrusive and avoidant thoughts and behaviors were measured by the Impact of Event Scale (IES) (Horowitz, 1979). Horowitz (1982) provided guidelines for determining low, medium, and higher levels of clinical concern based on total IES scores. The male mortuary workers had medium level IES scores (15.6) and the females had high scores (19.6).

Responses to Gruesomeness during Disaster Situations

There is little information on women's actual responses to gruesomeness during such tasks as disaster recovery or mortuary work. In a cross-cultural study of specific fears (Packer, Bond, Nigel, Siddle, and Macquarie, 1987), North American and Australian females scored higher on fears of mutilation (the MQ scale) than did Swedish females. In two separate samples of college subjects, women reported greater blood and injury fear than men (Kleinknecht & Thorndike, 1990). Psychometric studies of college students' responses to the MQ found significantly higher MQ scores by female college students (10.5, $SD=5.9$) than by males (7.5, $SD=4.9$). Groups that scored high on the MQ also scored high on a fear-relevant task, responses to slides depicting homicide and accident victims.

Information on women's responses to disasters is related to gruesomeness, but such sources ordinarily do not address specific stimuli in disaster situations. Extensive observations and lengthy interviews with women who perform such jobs in the military (McCarroll, unpublished observations) have found no differences in either the attitudes or performance of women and men. For both men and women in these fields, the more important questions are probably self-selection and training rather than performance once a person is in the field.

Follow-up Information of Persons Exposed to Gruesomeness

There is also generally a lack of follow-up information on women and their exposure to gruesomeness. Little is known about how women who have been exposed to such situations fare afterward compared to men. Among the groups most exposed to gruesomeness are nurses during war. Kulka, Schlenger, Fairbank, Hough, Jordan, Marmar, and Weiss (1990) presented significant findings of female Vietnam veterans in the National Vietnam Veterans Readjustment Study (NVVRS). Younger women (company officer grades) who served in Vietnam (primarily nurses) had almost twice the rates of posttraumatic stress disorder (PTSD) as those of the more senior women, field grade officers. It is likely that these responses were due to direct patient care exposure to casualties, although age at the time of exposure and experience with casualties could have been additional risk factors. At the time of the NVVRS study, a total of 26.9% of women theater veterans had full-blown PTSD at some point in their lives. The authors noted that women who had high levels of war zone stress, such as exposure to the dead and wounded, had seven times the rate of current PTSD as those with low or moderate levels of exposure. Those who were wounded (20.3%) or received combat medals (15.0%) had higher than average current rates of PTSD. Female Vietnam veterans exposed to war zone stress also had higher rates of major depressive episodes than Vietnam era veterans, civilian women, and women exposed to low or moderate levels of war zone stress, the one current disorder for which this was true. The lifetime prevalence rates for depression and alcohol abuse or dependence were significantly higher for women theater veterans than for women era veterans or civilians.

Furey (1991) noted that among the overall findings of the NVVRS study were that nearly half (48.1%) or approximately 3,500 of women theater veterans had experienced clinically significant war zone stress. Among the war zone stresses noted were the consistent exposure to severe combat casualties and death and dying. She emphasized the need for more understanding of the impact of specific war-related stress on women.

Paul (1985) reported that 43.8% of the nurses in this study had sought counseling after they returned from Vietnam. Schnair (1986) reported that half of the women nurses from Vietnam sought professional help for a mental health problem after they returned home from Vietnam. Twenty percent characterized their symptoms as significantly disruptive. Stressors noted included witnessing the mutilation of young bodies, in addition to nursing duties and responsibilities, negating their emotions, and supply shortages.

Gerlock (1991) described a trip back to Vietnam for veterans suffering from PTSD symptoms. Upon their return to the United States, it was pointed out by a group of women Vietnam veterans that this trip did not address the pain of seeing U. S. soldiers injured. This comment indicates the importance of developing specific therapeutic interventions for those who are troubled by intrusive memories or other symptoms resulting from the exposure to gruesomeness.

Conclusions

Few studies have been done on the exposure of either men or women to specific traumatic stimuli, such as gruesomeness. As is the case generally in traumatic stress research, most of the research findings are on men. Studies of anticipated stress in men and women that include both experienced and inexperienced body handlers implicate both sex and experience effects; however, differences in sex appear to be overcome by training. The decreased level of anticipated stress in both experienced men and women suggests that there might be an inoculation effect against this type of stress. It is also notable, however, that in both experienced men and women, the levels of anticipated stress were not trivial, suggesting that experience has only moderate effects and that the minimal level of discomfort with the dead is still substantial. Self-selection is likely to occur among mortuary workers and others, such as nurses, who anticipate some exposure to gruesome situations such as handling mutilated bodies. The significantly high level of anticipated stress reported by inexperienced women deserves further attention and suggests an important role for supervisors of such women prior to the handling of remains. For example, specific interventions may be implemented in this circumstance such as pre-briefings of what the women will encounter and might experience. If time allows, a gradual exposure to the actual scene could be provided, or, if the number of disaster workers allows, some people might be allowed to "titrate" their own exposure to gruesome scene. All these measures could be considered such that these inexperienced women would not have to enter a disaster scene with a higher burden of distress than men, stress that must be taken into account even before the actual stressful event begins. Such distress could contribute to higher levels of arousal resulting in irritability, fatigue, and lower performance compared to groups that do not start with such a high stress level.

The second major variable is that of training. It was noted that experience lowers anticipated stress. Those who plan training programs should learn as precisely as possible what it is that training effects and whether men and women have different needs in these topics. Individuals have vastly different experiences in encountering trauma and violence and, in addition, each individual's interpretation of that situation and his or her reaction also has the potential to be different. However, it is likely that discussion groups prior to a disaster could greatly facilitate each individual's training and experience by allowing people to hear each other's views.

Finally, we need to ask whether there are there variations in mental health following exposures to gruesomeness, and whether disaster-related stimuli are more potent stimuli for women than for men? Such studies could lead to a better understanding of risk factors that are specific for men and women. For example, evidence from Vietnam nurses suggests

that young age may have been a risk factor for that group of women. It is particularly important for future generations of nurses that information be obtained on how this risk factor can be decreased such as through preparation and training, gradual exposure, social support, or follow-up counseling after the exposure.

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Depression and Suicide

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Introduction: Gender Differences

Being either male or female is obviously an essential aspect of our biology. But our biology is inadequate for distinguishing differences between males and females. We are born either male or female (with some anomalies). However, we become masculine or feminine. Thus, our identity as either a male or female rests only partly on anatomical differences (Money and Erhardt, 1972). Our awareness of ourselves as "girl" or "boy," as "masculine" or "feminine," is best understood as a consequence of a complex biopsychosocial process, resting on both inner experiences, our sense of being male or female (**gender identity**), and outward expressions, those behavior patterns considered normative and appropriate to our gender (**gender role**).

The complexity of this process needs to be understood if one is to appreciate how gender relates to suicide and suicidality. For as males and females differ, so do their suicidal behaviors, the presumed etiologies of these behaviors, and often the contingent reinforcers to these behaviors. In addition where gender identity and gender role are either confused, dysphoric, or disturbed, there may be sufficient inner conflict or externally imposed stress to predispose a particular vulnerability to suicidal behavior. This vulnerability may be especially relevant to our understanding the relationship between **sexual orientation** (a person's tendency to be attracted to opposite- or same sex partners) and suicidality (see below).

All behaviors, except perhaps those that are reproductive, are found in both males and females. Their expression, or the thresholds for eliciting them, are simply matters of "more" versus "less" in each gender. For example, aggression may have a lower threshold in most males than in most females. Repertoires of aggression as coping behaviors among men are more sanctioned by social acceptance and expectation. Similarly, help-seeking is often associated more with females than with males. Some of these differences are determined and governed more by biological (genetic, biochemical; e.g., varying testosterone levels) versus social-cultural (child-rearing, reinforcement) factors. Most sexual differences are shaped during childhood but are notably and significantly in evidence with the arrival of hormonal changes at puberty. However, all generalizations have their exceptions.

In many ways males and females appear to have become increasingly similar. Social attitudes, historical trends, and political agendas all influence the relative treatment of males and females, those behaviors considered normative for each gender, and the acceptance or rejection one feels for being this or that gender or for having a minority gender identity.

We are primarily interested in this chapter in exploring how suicidal behavior relates to gender and how gender norms affect suicidal behavior. For example, are there behavioral differences between the sexes in their suicidal behaviors? Are these differences stable across time and culture? Are any differences noted due to biology, gender roles, or complex interactions between psychological (e.g., needs), biological (e.g., hormones), and cultural (e.g., role expectations) factors?

A brief note about gender differences is appropriate. Although most of us accept a number of gender stereotypes ("Males are.../Females are..."), research has substantiated only a few, mostly small, disparities between the sexes. Of those relevant to suicidology, even fewer appear germane. In the cognitive domain, females are more verbal than males (Linn & Hyde, 1989). Thus, we might expect to find differences in suicidal communications with females "crying for help" more than males. In the social domain, aggression, both physical and verbal, is more characteristic of males (Eagly, 1987). Thus, we might expect to find more violent behaviors (including suicides) among males. Females are more sensitive than males to nonverbal communications and cues (Hall, 1984). Thus, they are more empathic to the feelings of others, and are more susceptible to social influence than males (Becker, 1986, Ashmore, 1990). Also, there is some suggestive evidence that females are more willing to admit to their fears and anxieties (Hyde, 1985). Thus, we might expect to find more social reactivity and help-seeking/help-accepting among females.

As modern society demands more androgyny and becomes less patriarchal (that is as gender equality becomes more the norm) it becomes less clear what constitutes uniqueness in gender identity. Both males and females may experience more role confusion and display the effects of greater stress in adapting to culturally sanctioned change. One outcome of this levelling effect might be observable in changed suicide rates. As an illustration, Davis (1981) has provided evidence supporting Stack's (1978) hypothesis linking role strain and suicide. Stack (1978) hypothesized that women entering the labor force would reflect increased strain due to increased demands of both outside and household responsibilities. Davis demonstrated that during the 1950s and 1960s, as women increasingly entered and participated in the labor force, their suicide rate did increase.

This finding, however, has been contested. Ornstein (1983), using data from British Columbia, for example, found that women in the workforce were less likely to complete suicide than were either unemployed women or housewives. Moreover, as we shall see, data from more recent decades gives evidence for a declining suicide rate among females in general.

As a correlate to these changes, historical differences in gender specific suicidal behavior may disappear. It may be predicted that as men increasingly are encouraged to shed stereotyped roles of self-control and rationality and to express their fears and anxieties, they, too, will experience less inner tension, be more accepting of help and succorance, and consequently will be less lethal in their suicidality. Interestingly, the data do not appear to substantiate this hypothesis.

For the present, males and females do appear to express psychological distress differently. For example, adult males have higher rates of substance use disorders (alcohol and illicit drug abuse), antisocial behaviors, and gender identity disorders. Adult females have higher rates of anxiety disorders, eating disorders, depression, and prescription drug abuse (Regier, Boyd, Burke, Rae, Myers, Kramer, Robins, George, Karmo, & Locke, 1988). These pathologies (and others that are more age related such as conduct disorders in adolescent males) are significant risk factors for suicidal behaviors.

Similarly, studies comparing homosexual to heterosexual groups have demonstrated higher rates of certain risk factors (such as substance abuse, Fifield, 1975), in the homosexual population (primarily male), suggesting possible potentiating conditions for more frequent suicidal behavior in this population.

Gender Differences in Health and Mortality

Generally, males have a greater incidence of serious health problems and a shorter life span. Even *in utero* males are less viable (Harrison, 1978). From early childhood through old age, males have higher rates of death than females for all the leading causes of death. It has been estimated that as much as 75% of the sex difference in life expectancy can be accounted for by gender role behaviors, specifically the greater involvement of men in high risk health behaviors like cigarette smoking, alcohol abuse, hazardous activity, and violence (Waldron, 1976). For example, more males than females drink alcohol and considerably more males than females drink alcohol to excess. Consequently, men's rate of death from cirrhosis of the liver is about twice that of women (Eisler & Blalock, 1991). Looking specifically at violent death, males are three times as likely as females to die in motor vehicle accidents and more than four times as likely to die by suicide.

The Epidemiology of Gender Differences in Suicidal Behavior

Some of the most consistent findings in suicidology are sexual differences. Males tend to complete suicide more than females and females tend to attempt suicide more than males. However, there are important variants to these generalizations when the data are examined by age groups, by race, time, and by interactions among these variables.

In 1992, only 19% of suicides in the United States were completed by females. The ratio of white male to white female suicide was 4.1:1 in 1992; among blacks, the rate was six times higher among males; and among Hispanics, suicide was five times more common among males than females. From the 1930s to 1971 (when the male to female suicide ratio hit a low of 2.5:1), the ratio of male to female suicide was steady or declined. However, the suicide sex ratio has increased since 1971, due to dramatic increases in younger male suicide and a decline in the female rate (McIntosh & Jewell, 1986). For example, for the 20 to 24 year old age group, the ratio of white male to white female suicide increased from 4.7:1 in 1980 to 6.6:1 in 1992. Among blacks, age 20 to 24, the ratio of male to female suicide increased from 6.4:1 in 1980 to 8.8:1 in 1992. Among Native-Americans aged 20-24 who completed suicide in 1992, the male:female suicide ratio was 11:1, almost double the ratio for all Native-Americans that year (Kachur, Potter, James, & Powell, 1995).

Cross-culturally, the ratio of male to female suicide varies markedly, particularly when age is examined. For example, Lester (1991) looked at suicide rates for over twenty different countries and validated three different patterns to this ratio across the lifespan; viz., either a linear increase with age, a unimodal peak in middle age, or a bimodal distribution with a minor peak at the younger ages and a major peak in old age.

The male rate is consistently greater than that for females in almost every culture (Lester, 1984). Exceptions can be found in some subcultures. For example, In some ethnic subcultures, such as whites living in the East Harlem area of New York City, female rates have been found to be equal to those of white males and two to three times as great as those of Puerto Rican and black females in the same community (Monk & Warshauer, 1974). In the same study Puerto Rican males living in East Harlem were found to have a suicide rate three times greater than the rate of males living in Puerto Rico.

The 15-24 year old gender ratio has shown marked changes over time. For the United States in general in 1911 it was at a low of 0.7:1.0, in 1980 it was 4.7:1.0, and in 1990, it had risen to 5.3:1. Looked at another way, the discrepancy between male and female youth suicides in 1990 was more than seven and one-half times larger than that of 1911. Early in this century (in 1910) the suicide rate for white females, aged 15-19, exceeded that for 15-19 year old white males, but then declined thereafter (Dublin, 1963). Table 1 depicts a decade by decade comparison of male-female youth suicide rates since 1950.

Table 1

Suicide Rates and Ratios for 15-24 Year Olds by Sex, 1950-1990, U.S.

Year	Rates Males	Females	Ratio M:F
1950	6.5	2.6	2.5:1
1960	8.2	2.2	3.7:1
1970	13.5	4.2	3.2:1
1980	20.2	4.3	4.7:1
1990	20.9	3.9	5.3:1

Source: Suicide Surveillance Summary Report, Centers for Disease Control and Prevention, September 13, 1994.

Among females, suicide rates from adolescence to midlife (ages 15-39) tend to increase linearly with age and be highest among Native Americans. As shown in Table 2, these rates are followed in descending order by those for Whites, Asian/Pacific Islanders, Hispanics, then Blacks.

Recent temporal changes. Referring back to Table 1, it is evident that female suicide rates increased between 1950 and 1980, then appear to have begun a slight decline over the next decade. Examining this trend more closely for the period between 1980 and 1992 (see Table 3), White and Black suicide rates show consistent declines for females at all ages between 20 and 39; however, rates for 15-19 year olds showed an opposing trend.

Table 2*1990 United States Female Suicide Rates by Age/Race*

Race	Age: 15-19	20-24	25-29	30-34	35-39
White	4.0	4.4	5.2	6.7	7.4
Black	1.9	2.6	3.9	3.5	4.2
Asian/Pacific Islander	4.0	3.8	2.8	5.2	4.5
Native American	6.5	5.8	5.4	9.8	1.2
Hispanic	3.2	3.1	2.5	3.3	2.5

Source: Suicide Surveillance Summary Report, Centers for Disease Control and Prevention, September 13, 1994.

Table 3*U. S. Female Suicide Rates, Ages 15-39: 1980-1992*

Age	White Females		Black Females	
	1980	1992	1980	1992
15-19	3.3	3.7	1.6	1.9
20-24	5.9	4.0	3.1	2.4
25-29	6.9	4.5	3.4	2.7
30-34	8.0	6.1	4.9	3.8
35-39	8.7	6.8	3.8	3.0

Source: Kachur et al. (1995).

Gender differences in nonfatal suicide attempts. The epidemiology of nonfatal suicide attempts suggests that sex differences may be equally profound here, particularly in the adolescent and young adult age groups. Among children under the age of 14, more boys than girls require hospital treatment for a suicide attempt (see Cohen-Sandler, Berman, & King, 1982) and, by adolescence, boys appear to have greater intentionality than girls (Spirito, Bond, Kurkjian, Bosworth, & Brown, 1993).

Pfeffer (1985) asserts, however, that there is no difference in the degree of severity of suicidal tendencies (when considering ideation as well as overt behavior) between the sexes at early ages. By their mid-teens, however, girls outnumber boys as attempters by a ratio of roughly 4:1, although some have estimated this ratio to be as great as 10:1 (Toolan, 1975). The ratio of nonfatal attempts to completions among 15-24 year old males has been estimated to be 26:1 and among 15-24 year old females, almost 200:1 (Schuckit & Schuckit, 1989). This predominance of females as suicide attempters remains consistent

through adulthood, although the frequency of attempts peaks among females aged 15-24 (Schuckit & Schuckit, 1989), and is most easily documented by gender differences in histories of **prior** attempts in psychological autopsy studies of completers (See Maris, 1981). In addition, the greater frequency of female attempters can be documented in almost all countries, with the possible exceptions of Poland and India (Weissman, 1974).

Case-finding methods may explain some of the observed gender differences in attempted suicide. Weissman (1974) argued that studies relying on hospital admissions will yield a preponderance of women (as more frequent help-seekers), whereas cases that include self-injuries in jail and prison settings (which are overwhelmingly male) will reveal a more equal gender ratio. Furthermore, Garfinkel (personal communication, July, 1990) asserts that when more rural (vs. urban hospital emergency room) samples of attempters are studied, the usually observed gender differences wash out.

Gender and method. Gender differences have consistently been found in choice of suicide method and may explain part of the gender difference in rates of completed and attempted suicide. Females tend to use a greater variety of methods, many of lower lethality than those of men, particularly drugs (poisons) -- which in 1990 accounted for 26% of female suicides, compared to only 5% of male suicides (Table 4). Drugs are the preferred method among parasuicides. Females, representing both the modal parasuicide and the modal drug ingester, are more likely to survive their attempt. Conversely, males use more lethal methods, particularly firearms and hanging (66% and 15% of all methods, respectively, in 1990), and are more likely to die when they attempt. As a corollary of using more lethal methods, males are more likely to not have as frequent histories of prior attempts before completing suicide (Maris, 1981, chapter 10).

Table 4

Percent Method of Suicide and Gender, 1970-1990, U.S.

Method\ Year	1970		1980		1990	
Gender:	M	F	M	F	M	F
Firearms	58	30	63	39	66	42
Hanging	15	12	15	11	15	12
Drugs	9	37	6	27	5	26
Gas	11	11	8	12	7	9
Other	7	10	8	12	7	11

Some period effects suggest a long term increasing lethality among female completers who proportionately are using firearms more and poisoning less frequently than in years past (Table 4). Since 1980, firearms have been the method of choice for both males (66%) and females (42%), who consequently rarely survive these lethal attempts.

The reasons for these differences in method choice probably may best be explained by socialization (females are less likely to have experience with or be comfortable with guns), availability (males are more likely to have a gun in their possession and females have greater access to prescription drugs, except, perhaps, in military and paramilitary settings), and association (drugs are painless, easy to use, lack messiness, and do not disfigure the body). These differences also may mark differences in intent, with females being thought to be more ambivalent about dying, wanting to use suicidal behavior more as an instrumental communication, e.g., to coerce change in others, and wishing to be rescued more.

Suicide and the Military

Consistent with rankings for same-age civilians, suicide is the third leading cause of death, after accidents and homicide, among peacetime active-duty military personnel. Yet, the prevalence of suicide in the armed forces is only one-half to two-thirds that for matched groups in the general population (Kawahara & Palinkas, 1991; McDowell, 1994; Rothberg, Bartone, Holloway, & Marlowe, 1990; Rothberg, Fagan, and Shaw, 1990). Suicide rates, however, vary widely across commands, with annual rates in the 1980s ranging from low rates overseas up to 32 per 100,000 in the Air Force Logistic Command (Lipshitz, 1995). These variations remain unexplained.

In general, suicide rates tend to decrease during wartime (Clarke & Sutton, 1992; Lester, 1993). However, military service during the Vietnam war appears to have caused an increase in postservice mortality, particularly in the first five years (Centers for Disease Control, 1987) and, in particular, in male suicides (Hearst, Newman, & Helley, 1986).

There are relatively few studies of suicide mortality among females in the military. A twenty year retrospective study of a cohort of women Vietnam veterans, compared to women veterans who had never served in Vietnam, found nearly the same suicide rates (Thomas, Kang, & Dalager, 1991). During Operation Desert Shield, the United States Army recorded six suicides, only one of which was female (Clarke & Sutton, 1992).

The female suicide rates among active-duty Army personnel, however, appear to be higher than those for females in the general population. For example, Rothberg and Jones (1987) report rates for female Army personnel for the period 1977-1982 to be 9.9/100,000 (but with a notable decline between 1977 and 1982). As noted in Table 1, the 1980 rate for females aged 15-24 was only 4.3 per 100,000. Even if we assume higher rates for older females in the general population, as seen in Table 3, the Army rates remain higher. Similarly, the male to female rate ratio as reported by Rothberg and Jones (1987), 1.3:1, is considerably lower than noted in general population comparisons. Rothberg and Jones (1987) further report that among officers (vs. enlisted personnel), the female suicide rate surpasses that of males; and that the ratio of White to Black female suicide is about double that seen in the general population.

Risk factors for suicides in the military appear to be no different than those found in civilian populations, and include premilitary vulnerabilities caused by family instability and early trauma, e.g., sexual and physical abuse, responsible for later psychopathology and alcoholism (Brown & Anderson, 1992; Fontana & Rosenheck, 1995). Interestingly, military female suicides do not appear to use firearms appreciably more often than do civilian females (Rothberg & Jones, 1987).

Vietnam veterans diagnosed with posttraumatic stress disorder (PTSD), compared to those with no PTSD diagnosis, were almost four times as likely to die by suicide (Bullman & Kang, 1994). Thus, intensive combat-related guilt may significantly predict the development of PTSD and increased suicidality (Hendin & Haas, 1991). The most common precipitant is the collapse of a dyadic love-object relationship (Rothberg, Fagan, & Shaw, 1990).

One significant outcome of combat is disability, injury, or amputation. These, in turn, may lead to depression and increased suicidality. For example, the social discomfort of leg amputees has been a significant predictor, therefore marker, of depression, independent of gender (Rybarczyk, Nyenhuis, Nicholas, Schulz, Alioto, & Blair, 1992). Earlier findings reported by Frank, Kashani, Kashani, Wonderlich, Umlauf, and Ashkanazi (1984), however, suggest that the degree of depression and psychiatric symptomatology in younger amputees was directly related to the time since amputation. While noting significant ambiguity in the literature, Friedland and McColl (1992) conclude from their review of the literature that there is a higher incidence of depression in people with disabilities than in the general population.

Hypotheses About Gender Differences in Suicide

Beginning in the nineteenth century explanations for gender differences in suicide were tied to what interpreters believed to be different gender motivations. In men these concerned real or fancied impotence, business embarrassments, losses, ungratified ambition, etc., and in women they included domestic unhappiness, loss of honor or purity (illicit love affairs), disappointed love, betrayal, etc. (Kushner, 1989). Furthermore, women were described as being more protected from suicide by such virtues as being able to cry, having greater religious involvement, and "the relatively less harrassing part she has taken in the struggle for life" (Kushner, 1989: 100).

Twentieth century hypotheses, as we shall see, may not appear dramatically different than these earlier characterizations. The more modern hypotheses have at least been subject to greater empirical testing. However, some hypotheses remain colored by the politics of one's era and culture. Note in particular the following perspective espoused by proponents of the men's movement during the 1980s.

Suicide and Gender: A Male Perspective

Kammer and Sayles (1987), writing in the magazine, Fast Lane "For Today's Man," describe the fundamental life problem as a "sort of Nutcracker Effect," on one side a pressure to succeed and, on the other, an inability to admit weakness and seek help. The social pressure on men, they assert, is "to have it all," from the high paying job to the European car to the beautiful mate. Failure to achieve this ideal is a given for men but their struggle and their pain do not get compassion from others, especially from other men. They may grow hopeless (whereas women are allowed to be helpless) and, if men seek help (which they are not likely to do), they are closer to the edge than a woman would be. Not wanting to be a burden on others, male suicide reflects leaving "like a man."

Warren Farrell, writing in Why Men Are The Way They Are (1988) claims that while men feel the pressure to win a woman through performance and material superiority, women continue to reinforce this pressure because (in spite of their increasing liberation and independence) they still cling to the "primary fantasy" of having a man take care of them. So as women achieve in a traditionally male world, the pressure on men only increases.

Women's increasing independence may also signal changes in their willingness to tolerate problems in a male (Hanauer, 1989). Given the message to open up and be more vulnerable with women, a man may become confused and fear abandonment should he express his sense of failure and helplessness to a strong and independent woman he has sought to impress.

In this sociobabble there are shreds of truth and a kernel of something very important to understanding both gender differences and their changes over time. And that has to do with differences between males and females in their coping strategies. If overwhelmed, women typically seek help. Females are trained from birth that relationships are to be nurtured and that a dependent position is acceptable. Help-seeking is therefore acceptable. A woman's identity is neither compromised nor diminished by turning toward others for support.

For males, on the other hand, it simply is not as acceptable to be as openly in need, to self-disclose one's vulnerabilities, or to seek help. Rosenthal (1981) referred to this as a fear of cowardice (fear of social disapproval) among men. Society sanctions self-reliance, toughness, and the avoidance of emotional expression among men, in spite of findings that males do not differ from females in the experience of uncomfortable emotions (Allen & Haccoun, 1976). Indeed, there is evidence to support the notion that others tend to respond to males in suicidal crisis less empathically and with less acceptance (see below).

Moreover, as noted earlier, it was predicted that as women increasingly entered the work force (i.e., a traditional male enclave), their suicide rate would increase and ultimately surpass that of males (Neuringer, 1982) under the stress of dual careers (work and family-mothering). This has simply not happened. It would appear that working women have gained from the world of work, in self-esteem, in income, in independence, and in the rewards of interacting with other adults on a daily basis.

There is no empirical support for gender differences based on relative strength (e.g., that women are physically weaker), pregnancy, or menstruation (Canetto, 1992; Harry, 1989).

Suicide and Gender: A Female Perspective.

"For a woman, a decision to kill herself and therefore destroy all relatedness stands in direct opposition to the values most central to her core identity."

Alexandra Kaplan
Rona Klein

The importance of relationships and relatedness to others (including child-bearing and child care) may provide a core understanding of female suicidal behavior, according to clinical theoreticians at the Stone Center at Wellesley College (Kaplan & Klein, 1989). In their model society is seen as more demanding of women creating synergistic interactions with others, that is a woman's sense of meaning and value (sense of self, self-esteem) is derived from a mutuality of care and responsibility in relationships. A woman's vulnerability to suicide, therefore, increases when her opportunity for growth within relationships is perceived as blocked or distorted.

This model (as opposed to phallogentric developmental models, like Erikson's, 1982) poses that women generally strive to preserve relationships, not because of a dependency, but because the connection to others maximizes growth opportunities. Suicidal behavior, then, represents a desperate plea for engagement under conditions of threat to that connection. The relatively low suicide rate among women is understandable in this context, as a woman would typically find it more difficult to abandon those perceived as needing her and would be more attuned to and concerned for how others would be affected by her death. Also in this context suicide attempts would be more common among women than men as their primary motivation would be an appeal for connectedness to others.

Cumming and Lazar (1981) provide an interesting affirmation of this position through their analysis of Canadian suicide rates. They found that employment appeared to serve a protective function for women, while marriage served a protective function for men. For women, work increased opportunities for adult relationship; for men, marriage enabled them to gain a network of affiliations maintained by their wives. It is for this reason, perhaps, that divorce and separation are more associated with (as precipitants of) male suicides than with female suicides (Maris, 1981).

Social support and social involvement are buffers or protective factors to suicide risk. Studies have consistently shown that women have more close friends, more perceived sources of support, and more interactions in which support is either given or received than do men (Eisler & Blalock, 1991).

Suicide and Stress

Gender differences in coping styles, noted above, may be profoundly more important than differences in stress as explanatory factors for understanding suicide. Nevertheless, stressful life events both precipitate and predispose individuals, irrespective of gender, to be suicidal.

Paykel (1989) has summarized the research on stress and suicide, most conducted with adult subjects, and concluded that life events "strongly and consistently precede suicide, attempted suicide, and suicidal feelings." These findings pertain when suicidal subjects are compared to both the general population and psychiatric populations, including depressives. With regard to predisposing conditions, there appears to be a reasonably strong association between early parental loss by divorce or separation and both later depression and suicide attempts (Greer, Gunn, & Koller, 1966; Crook & Raskin, 1975; Goldney, 1981; Adam, Bouckoms, & Streiner, 1982). Goldney (1981) also found that young (age 18-30) female attempters were more likely than normal controls to report parental quarrelling, frequent disagreements with their parents, financial problems at home, poor childhood physical health, and various other negative parental characteristics. Early traumata such as physical and sexual abuse, also, are significant predisposing events in the lives of suicidal women (see below).

Social Acceptability and Suicidality

Social acceptability may play a significant role in explaining gender differences in suicidal behavior. Linehan (1973) hypothesized that social expectations of suicidal behavior varied as a function of the sex-role of the suicidal person. She tested empirically whether social acceptability of suicidal behavior varied by type of suicidal behavior (completed vs. attempted) and sex of the suicidal person. She found that, indeed, completed suicide was considered more "masculine." Similarly, Hammen and Peters (1977) found that males were perceived more negatively for the expression of helplessness, hopelessness, self-depreciation, and passivity; and thus more positively for acting on versus communicating their suicidality.

Rich, Kirkpatrick-Smith, Bonner, and Jans (1992) found support for this view, in that male adolescents had greater fear of social disapproval over having suicidal thoughts while females had a greater fear of death and injury. An early review by Pollak (1980) did note that women reported more fear of death than men; however, later studies suggest gender differences more reflect differences in emotional expression and personal disclosure and in locus of control, which correlates with both sex and fear of death (Niemeyer, 1994).

Several studies have examined the sex of the observer (i.e., potential helper) as a significant component in the differential labelling and (thus) potential intervention process. Berman (1978) provided stimulus vignettes of stressed or bereaved persons (varying their gender) and asked male and female subjects to rate the severity of their problem, their suicidal risk, their need for intervention, etc. He found that males (significantly more than females) saw males as more depressed and more pathological than females dealing with identical problems. Similarly, White and Stillion (1988) studied gender specific responses

to suicidal persons. While females (compared to males) were more sympathetic to all troubled people, males were most unsympathetic to suicidal males. Lesham and Lesham (1976) and Wellman and Wellman (1986) also found males to be less sympathetic and more reluctant to respond to suicidal individuals. Thus, cultural norms and social expectations do appear to reinforce the acceptability of suicidal behavior by males, while making completed suicide more gender-inappropriate for females. We note the tautology here. That is, if males indeed, do kill themselves more frequently than females, then we come to expect that behavior of males more than females.

These findings suggest that contingent reinforcers may shape suicidal behavior in gender-specific ways. As an example of this, Potts, Burnam, and Wells (1991), studying data on more than 23,000 patients and 500 clinicians, found that depression was generally underdetected in men and overdetected in women. They suggest that in depression screenings males may be less likely to express their feelings or more likely to deny being depressed. However, it is equally possible that males were not as expected to be depressed or to discuss being depressed and, therefore, were not asked about their symptoms as frequently as women were.

Gender, Mental Disorders, and Suicide

The link between diagnosable mental disorders with both completed and attempted suicide is strong. Affective disorders, schizophrenias, alcoholism and drug abuse, and comorbid presentation of these disorders with each other and other disorders (e.g., borderline personality disorder, panic disorder, eating disorder), have especially strong associations with suicide risk (Tanney, 1992).

Table 5

Odds Ratios for Completed Suicide in Males and Females

Study:	Shaffer (1994)		Brent (1994)	
Disorder \ Gender:	M	F	M	F
Affective Disorder	11.3	25.2	10.0	17.0
Major Depression	16.1	-	15.1	28.5
Conduct Disorder	3.5	3.3	6.4	1.5
Anxiety Disorder	3.2	0.7	11.1	3.0
Substance Abuse	7.2	-	12.6	13.0
Alcohol Abuse	5.8	-	10.1	9.8
Drug Abuse	-	-	23.9	6.2
Bipolar Disorder	-	1.6	4.7	6.2

Two psychological autopsy studies of completed adolescent suicides (Brent, Perper, Moritz, Baugher, Schweers, & Roth, 1994; Shaffer, Gould, Fisher, Trautman, Moreau, Kleinman, & Flory, 1994) used community controls, therefore allowing odds ratios (ORs) between different disorders and suicide in males and females. These ORs are summarized in Table 5 by gender. As noted in Table 5, mood disorders are more strongly associated with suicide in females; all other disorders are more likely to occur in males. In addition, in the Brent et al study a history of previous attempt was found to be four times more likely among females, with an odds ratio of 119.1! In epidemiologic studies of suicide attempters no clear gender differences are discernable (Brent, 1995).

Overall women are diagnosed with mental disorder more frequently than men are (Gove, 1979). Some significant gender differences in specific disorders are also evident, although these differences have been questioned (see below).

Depression

Depressive illness (actually several distinct disorders), the disorder most often associated with suicidality, is diagnosed twice as often among adult women as among men (Weissman & Klerman, 1977; Nolen-Hoeksema, 1990). Although this finding appears to be consistent in both epidemiologic and clinical studies, it has been challenged on the basis of case ascertainment methods (see below), social status confounding (Wilhelm & Parker, 1989), cultural differences (Orley, 1979), and different patterns of service utilization and diagnostic bias, with females seeking treatment more often and being over diagnosed as depressed. In addition, no difference in gender has been observed in bipolar disorders (Leutwyler, 1995).

Assuming this gender difference is not artifactual, two primary mechanisms have been proposed to explain it (Pajer, 1995): the **biological hypothesis** asserts that depressive symptoms may be provoked by shifts in hormonal levels in women who are genetically vulnerable to affective disorder or stressed by psychosocial problems. For example, hormonal differences between men and women have been shown to affect sleep cycles, thus mood. Females, also, have been found to produce less melatonin during the summer (Leutwyler, 1995). George and colleagues (c.f., Leutwyler, 1995), moreover, have demonstrated that women produce an eight-times greater (than men) blood flow to the anterior limbic system when sad. They suggest that this exhausts the limbic system leading to hypoactivity during clinical depression.

The **psychological hypothesis** postulates that women are more dependent than men and tend to internalize stress and pain. Internalized stress leads to self-blame (versus blame toward externalized objects) and depression when under stress, given women's relatively low status and powerlessness.

Biological and psychological factors, of course, may also interact. Stressful life events have been shown to induce depression in women with a genetic predisposition; at the highest level of genetic risk, exposure to a severe stressful life event increases the risk of onset of major depression by 13.5% in the next 30 days (Kendler, Kessler, Walters, & MacLean, 1995).

Women become symptomatic with depression at younger ages than men (Ernst & Angst, 1992) and have high rates of comorbidity when depressed (Winoker, Black & Nasrallah, 1988). Depression presents twice as frequently with a secondary anxiety disorder among women (Ochoa, Beck, & Steer, 1992), and is three times as frequent in chemically dependent female adolescents (Deykin, Buka, & Zeena, 1992). Somaticization (Smith, 1992) (see below) and eating disorders (Jimerson, Lesem, & Kaye, 1990) are also commonly comorbid with depression in women.

Anorexia is overwhelmingly found (by a 9:1 ratio) among females (Gove, 1979). In contrast, alcoholism and the use of illicit drugs occur four times more frequently among men (Colton & Marsh, 1984). The use of mood modifying prescription drugs, however, is twice as frequent among women as among men (Colton & Marsh, 1984), perhaps explaining their availability for use in nonfatal suicide attempts by women. We should note that there is, in part, an iatrogenic effect here, as physicians prescribe antidepressants (e.g., benzodiazepines) twice as frequently to females.

Women also show different diagnostic patterns among the personality disorders, with more frequent assigned diagnoses of histrionic, dependent and avoidant personality disorders (Adler, Drake, & Teague, 1990; Kass, Spitzer, & Williams, 1983; Zimmerman & Coryell, 1990). None of these studies, however, controlled for the presence of an Axis I diagnosis. Golomb, Fava, Abraham, & Rosenbaum (1994) studied a group of patients with a primary diagnosis of major depression. Using self-rated and clinician-rated measures of personality disorders, these researchers found that none of the personality disorders predominated in women compared to men. Thus these personality disorder diagnoses, because of overlapping symptom criteria, may reflect further undiagnosed or misdiagnosed depressive disorders in women.

We need to remember that the preponderance of females in both overall rates of disorder and in most of the specific disorders (excluding alcoholism and illicit drug use) is, partly, an artifact of our case finding methods. Excluding catchment area community surveys, most of our data is derived from emergency room and inpatient admissions. As females are far more likely to seek and accept offers of treatment, they overpopulate these data sites (c.f., Corbitt and Widiger, 1995). A good recent example of this concerns the prevalence of schizophrenia, commonly held to affect about equal proportions of men and women. When researchers in Vancouver, British Columbia concentrated on first episodes of schizophrenia only, as known to a broad sampling of health services and general practitioners (not just ERs and hospitals), they found that more than two-thirds were men (Iacono & Beiser, 1992).

Depression also is one of the most common causes of somatization (see Lipowski, 1988 for a review). However, as this disorder is defined, in part, by the seeking of medical help for somatic distress and symptoms, any observed gender differences in the prevalence of somaticization disorders must await community versus clinical setting case ascertainment.

Gender, Substance Use, and Depression

Alcohol and drug use are significantly related to suicide and suicidal behavior. Substance use can impair judgment, increase impulsivity, and exacerbate mood disturbances including acute suicidal depressions (Schuckit & Schuckit, 1989). In addition, intoxication with either alcohol or drugs often immediately precedes suicidal behavior. In one study (Paykel, Myers, Lidenthal, & Tanner, 1974), 40% of female attempters were legally intoxicated at the time of their attempt. It is well-known that alcohol and drug use are often used to self-medicate depression.

Substance abuse alone or in combination with an affective disorder appears in about one in three youth suicides investigated by psychological autopsies (Brent, Perper, Goldstein, Kolko, Allan, Allman, & Zelenak, 1988). Among adolescents, heavy substance users have a four-fold increased suicidal death rate (Shuckit & Shuckit, 1989). Moreover, drug and alcohol abuse in parents has been found to be a significant risk factor for suicide attempt behaviors among their offspring (Cohen-Sandler, Berman, & King, 1982).

Gender, Biology, Aggression, and Violence

The structural neuroanatomy of females is essentially the same as that of males suggesting they should have the same potential for aggression as men. Yet, there are clear gender differences in the frequency of observed aggressive acts. There is a great deal of research demonstrating that males have higher levels of aggression than females.

Learning plays a significant role in the gender-based social acceptability of aggression. Boys are highly encouraged during socialization to use aggressive strategies to cope (Doyle, 1989; Franklin, 1988). Women, on the other hand, as a consequence of many years of training, are generally more inhibited in expressing more direct acts of aggression (Suter, 1976).

In addition, men with depression tend to have greater levels of measured both state and trait hostility, suggesting that men may be at greater risk than women of developing patterns of pathological aggression and hostile behavior (Fava, Nolan, Kradin, & Rosenbaum, 1995).

In more recent years, our understanding of aggression has benefited from brain biochemistry studies, particularly of the serotonin metabolite CSF 5-HIAA and its relationship to suicide and especially violent suicide. As most of this research has focused on male suicidal subjects who tend to both have lower CSF 5-HIAA concentrations and account for the majority of violent suicides, it seems reasonable to speculate that gender-based biochemical differences may be significant in explaining differences in observed suicidal behavior. Van Praag (1982) has suggested that depression, hostility, and impulsivity all are traits correlated with disturbed serotonin metabolism and predispose one to both aggression and suicide. Recent work by Nielsen and colleagues (Nielsen, Goldman, Virkkunen, & Tokola, 1994) has demonstrated in a behaviorally

extreme impulsive group of alcoholic violent offenders that a genetic variant of the tryptophan hydroxylase gene may influence CSF 5-HIAA concentration, thus a predisposition to suicidal behavior.

Women have lower concentrations of testosterone than do men (Moore & Gillette, 1992); although there is no known direct relationship between testosterone and suicidal behavior, the link between testosterone and aggression has clearly been made (Hyde, 1990: chapter 3). Parallel to this, studies have demonstrated that during the course of a woman's menstrual cycle there is a drop in the production of the ovarian hormone estradiol (and other hormones), the consequence of which often is violent and aggressive behavior (Moore & Gillette, 1992). However, as noted earlier in this chapter, there is no consistent research evidence to support an association between stages of the menstrual cycle and suicidal behavior (see Lester, 1988, for a review).

Gender Differences: Some Residual Considerations

Personality differences between males and females have been suggested as explanatory of different patterns of suicidal behavior. Canetto (1992) has reviewed these hypotheses, noting particularly that descriptors of women's character have tended to be pejorative, even if associated with adaptation and survival. For example, women have been described as more passive, suggestible, and malleable than men (Breed & Huffine, 1979) with these characteristics underlying their lower rates of completed suicide. Canetto (1992) argues that women, as a result of their socialization and developmental experiences, may be capable of more complex and flexible coping than men, who have greater need to be in control, thus, are more rigid. This rigidity, particularly in the cognitive domain, has been thought to characterize the suicidal mind (Neuringer & Lettieri, 1982; Beck, Kovacs, & Weissman, 1975). It is reasonable to postulate a gender-based path model that may be central to our understanding of gender differences in suicidal behavior (See Bonner and Rich's (1987) "stress-vulnerability" model). Gender differences in suicidal behavior may reflect a tendency of males to respond with despair and hopelessness (the more rigid position) to stress, conflict, frustration, etc. Females may have a greater and more socially acceptable response of helplessness and a communicated need for help (a "cry for help" or help-seeking); i.e., a more flexible position. Thus, females tend to maximize their chances for attachment and succurance, while males tend to move more readily to a position of giving up and ending a perceived intolerable state of being. Studies of utilization of suicide prevention centers confirm the significantly greater tendency for women, particularly younger females, to seek and benefit from contact with these helping facilities (Miller, Coombs, Leeper, & Barton, 1984).

Gender Orientation: Homosexuality

The preference for a same sex partner, once considered unto itself to be psychopathological, presents unique stressors to the homosexual. The majority society is generally homophobic and even hostile. There continues to be a stigma to being gay, expressed along a continuum from negative verbal stereotyping and abuse to social

isolation to outright physical abuse. For those still "in the closet" the recognition and self-identification of one's homosexuality is laden with loneliness, anxiety, and confusion. In their families many emerging gay youth anticipate rejection as well, prompting an internalization of these negative societal attitudes. The consequence may be one of lowered self-esteem, depression, heightened use of alcohol or drugs, etc. for the homosexual person. Where familial attitudes are rejecting, particularly where the family system is characterized by substance abuse and physical abuse, substantial numbers of emerging gay youth choose to leave home for life on the streets and often a more promiscuous and substance abusing life style. As if this self-destructive pattern was not enough, with this now comes the increased risk of HIV infection and the prospect of death from AIDS.

In this matrix of internal conflict and external stressors, we note a number of well substantiated risk factors for suicidal behaviors: low self-esteem, loneliness, depression, substance abuse, and so on, strongly suggesting that homosexuality (particularly during the anxiety-ridden stage of "coming out") may breed increased suicide risk. Indeed, the few published empirical reports on suicidality among homosexuals do often report high rates of parasuicidal behavior. But where some interpreters declare there to be a clear and consistent relationship (Harry, 1989), others have concluded that to date "virtually nothing is known....about the relationship between homosexuality and suicidal behavior" (Clark, 1992).

As is common to all areas of relatively uncharted scientific investigation, the early and few published studies regarding this hypothesized relationship are of relatively poor quality, relying on biased (e.g., recruited) samples and often lacking in control or comparison groups. Although flawed, these approaches do at the least call attention to a possible problem and may eventually lead to serious investigations. At present, however, perhaps no area in suicidology is filled with more unsubstantiated and hyperbolic claims, controversy, and political interference in the process of scientific inquiry. Politics and scientific inquiry do not often make good bedfellows.

Gibson (1989) has asserted that "(gay and lesbian youth) may comprise up to 30% of completed youth suicides annually" and that "Suicide is the leading cause of death among gay male, lesbian, bisexual, and transsexual youth." While possible, nowhere in his report did Gibson substantiate these claims with empirical data or published studies. Gibson's assertions have exaggerated in their retelling. For example, in an article on gay teen suicide in the national gay and lesbian magazine *The Advocate* Maguen (1991) writes, "Gay and lesbian teenagers are killing themselves in staggering numbers" and "conservatively estimate(s) 1500 young gay and lesbian lives are terminated every year." What can we substantiate about the relationship between lesbianism and suicidality?

With regard to parasuicidal behavior, Clark (1992) has appropriately noted that there have been no truly representative community based studies comparing suicide rates in homosexual versus heterosexual communities. Clark goes on to recognize the difficulty in ascertaining sexual orientation in epidemiological studies. Underreporting in this culture may be expected due to the stigma attached to openly affirming one's identity.

The lesbian population is rarely represented in the published research to date. Data reported in the 1970s was summarized by Harry (1989) and do suggest higher rates of suicide attempt among homosexual versus heterosexual comparison groups. Saghir and Robins (1973) found an attempt rate of 12% among a sample of lesbians compared to a rate of 5% among heterosexual female controls. Bell and Weinberg (1978) reported a prevalence of suicide attempts for lesbians at 23% compared to 14% among heterosexual women.

Can anything reliably be concluded from these limited findings? It simply appears premature to make definitive conclusions, as we have no hard evidence to support higher suicide rates, no less an "epidemic," of completed suicide among gay and lesbian youth. The prevalence of parasuicide among samples of lesbians may be even higher than those of gay males. However, given that parasuicidal behavior is much more common among females in general, these comparative proportions may not be significantly greater than those of heterosexual female youth. Hendin (1992) provides anecdotal evidence from his studies of college student suicide that early family history is significant to our understanding of gay suicide. Of those male and female homosexuals among suicide attempters he studied, Hendin states, "In every case there was a history of early maternal abandonment which was not present among (non-suicidal homosexual controls). Guilt or shame over being homosexual was not a significant factor in their suicidal behavior (p. 1416)." Harry (1989) proposes that the older age of the typical lesbian attempter (>20) compared to the modal gay male attempter (<20) suggests that their attempts may be precipitated by depression consequent to the breakup of a relationship, rather than family conflict.

Suicide and Sexual Behavior

For many individuals both sexual acts and suicidal behavior defend against loneliness and loss of love, serving instrumental and interpersonal goals as attempts to exert control over others, to communicate, to manipulate, etc. For those driven to sexual acting out, a partial sacrifice of the self in defense of a sagging ego, the consequence of failing to gain control (or love) is a further assault to the ego. Thus suicide risk increases with sexual acting out, this becoming an additional risk factor along the suicidal pathway (see Maris, 1981). Illustrative of this Stephens (1987) described one of two types of female adolescents who as adults attempted suicide as fitting a "cheap thrills" pattern of behavior. These girls described themselves as "wild" and "unmanageable." They repeatedly ran away from home, used drugs, got into physical confrontations, and had frequent indiscriminate sexual escapades often resulting in pregnancy.

Suicide, Self-Injurious Behavior, and Sexual Abuse

"By day we were a perfect family. My father, a doctor; successful, well-respected, a giver to those he cared for, those he loved, those in the community less fortunate than we. By day, he was a saint; a man incapable of evil. By night, in my bed, he taught me something different, and he taught me that it never happened... ."

Anonymous

Sexual victimization, particularly at the hands of a parent, creates an overwhelming sense of powerlessness, worthlessness, and a felt inability to change or control one's environment. It creates self-loathing, in particular feelings of being dirty, a body loathing. It facilitates internalized feelings of shame, not the guilt of feeling one has done something bad, but a more pervasive sense of being bad. It creates self-blame (Shapiro, 1992).

"To be able to survive, I learned to go away. To go away meant some part of me could stay clean, untouched by evil. I learned to exist outside of my body. I refused all awareness of its pain, and paid the price of not knowing its pleasure. I chose to kill a part of myself so I could survive."

Anonymous

Childhood sexual abuse commonly leads to pathological sequelae, most often the development of dissociative states, including multiple personalities, the instability and rage characterized by borderline states, and comorbid unipolar or bipolar depressions. Self-injurious (self-mutilative) attacks on the body (see below) can be associated with these disorders and with the legacies of early childhood.

While the empirical literature documents a strong relationship between sexual child abuse and subsequent psychiatric problems (C.f., Carmen, Rieker, & Mills, 1984), including the development of suicidal ideation and behavior (Briere & Runtz, 1986; Deykin, Alpert, & McNamarra, 1985), it remains unclear whether abuse leaves the child more vulnerable to suicide in particular (Spirito, Stark, Fristad, Hart, & Owens-Stively, (1987). In addition, the severity, duration, and frequency of abuse may be significant co-determinants of subsequent, maladaptive symptoms and behavior.

Shaunesey, Cohen, Plummer, and Berman (1993) investigated the effects of sexual abuse during childhood on later adolescent suicidal behavior. Among a sample of 117 privately hospitalized adolescents (aged 13-18) thirty-six (30.8%) had a history of sexual abuse. Twenty of these adolescents (56%; 17.1% of the entire sample) had been both sexually and physically abused. Sexually abused patients reported significantly more previous suicide attempts than those reporting no abuse, irrespective of frequency and duration of that abuse. Females in this study were found to have been significantly more

likely than males to have experienced both physical and sexual abuse and were more likely to make suicide attempts. Shaunesey et al. conjecture that the higher frequency of attempts among females may be linked to a history of sexual abuse rather than simply to the fact of being female. In the only controlled study of female child/adolescent survivors of sexual abuse (Edwall, Hoffman, & Harrison, 1989), victims of both intrafamilial and extrafamilial abuse were significantly more likely to report past suicidal behavior and ideation when compared to nonabused controls.

Self-Mutilation and Gender

As noted above, some forms of self-mutilation can be quite extreme. Most common are wrist cutting and cigarette burning, typically of the arms. As described by Walsh and Rosen (1988) and Favazza (1989), the most common function and goal of these self-mutilative behaviors is to decrease tension or other intense affect, diminish a sense of alienation (emptiness, "deadness"), or terminate dissociation. Thus, these behaviors are a form of self-stimulation designed to break out of the numbness or deadness otherwise common to these patients' everyday experience; a sort of, "I bleed, therefore I am." These patients most often are diagnosed as borderline personality disorders and often present with a co-morbid mood or dissociative disorder; and, as noted above, often are found in patients with a history of sexual abuse. These patients are more commonly women than men.

Orbach (1994) postulates that early traumatic events (e.g., abuse) gradually create a detachment from the body. This indifference generalizes to new stressful situations, assuming the shape of physical numbness and apathy, including an indifference to bodily pain. Under continued stress prolonged feelings of helplessness and hopelessness lead to dissociative defenses which, in turn, facilitate self-destructive acts against the body and/or total escape through suicide.

Summary

Gender plays a complex and important role in suicidal behavior. By early adolescence males behave more lethally than females and differences in mortality rates continue across the entire lifespan and across-cultures. Male suicide appears most significantly tied to an overall greater frequency and level of violence and aggression and the relative lack of social sanction for accepting a helpless-dependent position in a help-giving relationship. On the other hand, the significance of relatedness and attachments to others and the importance of social supports appears to serve women most profoundly both as a protection against suicidal urges and as a precipitant for nonfatal suicidal behavior.

With the increased androgyny in American society and entry of great numbers of females into the traditionally male workplace (and the military) came predictions of male and female suicide rates regressing toward the mean. However, recent epidemiologic trends suggest just the opposite. There is in fact an increasing divergence of rates with male rates increasing and female rates decreasing. Rates of suicide among females in the military, however, appear higher than those of their civilian counterparts.

Throughout this discussion winds the binding thread of mental disorder as a predisposing and confounding variable for suicidal behavior. Affective disorders, in particular, appear significantly related to the suicidality of females and to co-morbid disorders which increase suicide risk. In addition, the impact of childhood sexual abuse appears significant in the etiology of later depression and both suicide and self-mutilative behaviors.

We await further empirical data to assess the relationship of gender identity or gender orientation on suicide, although it appears that the associated stresses of a minority gender orientation or identity may lead to higher rates of suicidality. Our understanding of suicide among homosexuals may be confounded by the significant involvement of substance abuse in their suicides. Also significant as predisposing conditions among lesbians may be depression and decreased social support.

A Note About Contagion

Exposure to suicidal behavior of another person in the social network of susceptible adolescents and young adults may trigger imitative behaviors. The primary mechanism by which exposure effects copycat behavior is modeling. Where ego boundaries may be diffuse (because of mental disorder) and the attention or notoriety given the first actor's suicidal behavior is perceived, the potential follow-up actor may believe that these consequences will attend their suicidal behavior also. This cognition includes the assumption that, even in death, this attention will be appreciated by the actor.

In some instances, the mechanism is that of identification, where the subsequent actor shares characteristics known or presumed about the initiating actor. The stimulus event, then, gives a quasi command or permission to follow, e. g., "if you believe you are (feel) like me, then here's the resolution to your problems."

Exposure may be either direct or indirect. In instances of direct exposure, the subsequent actor knew the initiating actor, e.g., as friend or acquaintance. In instances of indirect exposure, the knowledge is transmitted through word of mouth or media accounts. The majority of research on contagion has been in the area of indirect exposure, with the focus on nonfictional and fictional media as vehicles. This research (c.f., Berman, 1989) has documented that nonfictional presentations (e.g., in the print media) do stimulate imitative suicides (and attempts) and that there is a "dose-response" effect, i.e., the more publicity, the greater the potential for imitation. The Centers for Disease Control and Prevention has issued recommendations for the prevention and containment of clusters of suicides (Centers for Disease Control, 1988) and guidelines for the media to discourage imitative suicides in response to presentation of stories about suicide have been prepared by the American Association of Suicidology.

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Depression and Suicide: Effects of the Military Culture

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It is the goal of this essay to overlay what is known about "being-in-the-military" with the gender and suicide factors that have been derived primarily from civilian data. The most significant division between civil and military societies derives from the fact that the military is governed by a code (that specifies which actions are correct and which are incorrect in every situation), whereas civilian society has laws (that specify which actions must not be done). Parenthetically, in other areas of discourse, this is the classical contrast between harmony and invention. Because it has been over two decades since the draft ended, the overwhelming majority of current military are individuals who have self-selected into this social environment. These are individuals who have chosen to be part of a culture which impacts on every aspect of their lives. Whereas there is no lack of questions on the extent that this distinction influences an individual's response to his or her environment, as well as ultimate decisions about life and self-inflicted death, there is no work dealing directly with that point.

There are two examples of the influence of military culture on the individual. The first of these is the mandate for health promotion. This mandate includes a suicide prevention component which was designed to be universal by reaching every soldier's commander and supervisor (Rothberg, 1989). Such involved leadership represents one positive aspect of the regulated nature of military culture. Reports of the evolution of these programs continue to appear (James and Kowalski, 1996). A second example of the effect of military culture is the effect of a threat to continuation in service. In a manner somewhat akin to losing one's job for health reasons, the fitness-for-duty of a member of the military may be formally evaluated in a medical/physical evaluation process. The stress of the accompanying risk of separation from service has been reported to have precipitated two suicides (Fragala and McCaughey, 1991). Both the stress of separation and the suicide prevention programs represent two examples of the culture of the military which are, to the extent that they have been studied, gender indifferent.

The United States Military has been this nation's leading social institution for gender equality by offering equal access to most occupations. The majority of military occupations are gender independent and open to any who qualify. There are a small number of occupations, the direct combat positions, which have been closed to women. Since direct combat is a significant defining aspect of the military, this is a conceptually significant exclusion. To the extent that the role (the "job") of [being a] soldier is independent of gender, the civilian societal differences based on gender role should be diminished. Unfortunately, it is possible to argue somewhat convincingly for both of the opposing effects. On the one hand, access to the majority of positions may diminish the effects of gender. On the other hand, exclusion from what may be viewed as the fundamental criterion for full incorporation into the military, combat, might suggest that gender differences would be more pronounced in the military. To muddy the interpretation further, there are time-bounded transition effects that have developed as the fraction of females in the military has increased from a few percent to tens of percent. In contrast to males whose career progression has ample precedents, the first females entering "nontraditional" jobs found no role models. Their years of preservice civilian socialization with its gender distinctions provide no support in this situation. This process projects through the next cycle, since the second generation of females had role models consisting of females who themselves had no role models. We would expect there to be some period of time before the social support derived from access to role models reaches gender equality.

Data on suicide in the military contrast with civilian data. Historically, the suicide rate had been higher in the military compared to civilian society (Masaryk, 1970 (1881)). The reversal to the condition of a lower rate in the military occurred after World War II (Yessler, 1968). The salutary effect of war in reducing suicide was noted by Masaryk as was the tendency for a postwar elevation in suicides (Masaryk, 1970 (1881)). However, the hypothesis that the postwar elevation is due solely to the presence of veterans seems to be refuted by the data from a study of war veterans in Texas showing that veterans do not have an elevated suicide rate (Pokorny, 1967).

While the section on self-injurious behavior reflects an extensive civilian literature, there are few reports of military studies. The distinction between suicide and suicide attempts has been documented in the military with a fourfold gender difference (1975-1985: suicides = 5% female, suicide attempts 20% female) (Rock, 1988).

The comments of Berman (this volume) on contagion are particularly relevant for the military. The youthful population and the intimate working and living conditions as well as the intense group orientation of the working environment of the military would seem to be conditions allowing for contagion of suicide. Examples within the military have been reported (e.g., Grigg, 1988).

In conclusion, military leadership carries the responsibility for the service members' continued functioning. The goal of supporting our leaders by efforts to 'conserve the fighting strength' continues to activate military medical research in manpower loss areas such as depression and suicide and gender differentials. The discussion in this volume of depression and suicide, and in particular, sex differences in suicide and depression, will contribute in an important way to this goal.

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IV

Summary

**Beyond the Mythology:
A Constructive Approach to Sex Differences and Military Readiness**

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No one denies that there are real differences between the sexes. The military women with whom I have served over the years all seem to want just one thing: to be judged on the merit of their soldiering skills and on their record of performance. Nothing more, nothing less.

(Foote, this volume, p. 56)

The question is how to compose the force for maximal effectiveness, and then how to maintain that effectiveness over the time span required by the mission? It is like sailing in the ocean. You can complain forever about the wind; but if you are sailing, you sail the direction you want by understanding the direction the wind is blowing, not by decreeing it.

(Holloway, this volume, p. 9)

The challenge issued by General Foote and Dr. Holloway, and echoed by military women--and men--of varying rank, years of service, and occupational specialty, is not a simple one. That challenge is to reconcile the existence of sex differences with the composition and maintenance of an effective military. Two simplistic approaches to meeting this challenge can be cited. In its most extreme form, the first approach involves an exclusion of women from the military; a more moderate version of this approach excludes women from certain occupational specialties. Even the latter version of this approach is no longer tenable, nor even desirable, as downsizing requires maximal exploitation of resources. The exclusion of a substantial number of individuals from military occupational specialties on the basis of their group membership (e.g., sex) lacks *specificity* (many individuals are excluded who would perform assignments competently), and *sensitivity* (it does nothing to prevent the assignment of individuals who would do poorly).

A second approach to meeting the challenge of incorporating women into the military requires a complete denial of sex differences. This approach is weakened considerably even by a brief look at the empirical literature. This approach assumes that, given the opportunity to take on traditional male occupational specialties, women will perform competently. It is likely, in fact, that this assumption is valid for the majority of occupational specialties. It begs the more complex question, however, of how to elicit maximal performance from these comparatively new arrivals to the military. If the ultimate goal is military readiness, a more careful examination of sex differences is imperative.

The purpose of this chapter series, then, was to consider the empirical evidence for sex differences and to examine that evidence constructively--to contribute to an "understanding of the direction the wind is blowing" (Holloway, this volume, p. 9). As a first step toward accomplishing this purpose, the chapters in this volume stipulate evidence for sex differences in variables relevant to the health and performance of military women. This evidence speaks to "common knowledge" about women generally and, more specifically, about military women. In the case of some variables, the empirical evidence

may reinforce attitudes, beliefs, and operational policies. In other cases, the evidence may be inconsistent with those attitudes and beliefs, and may reveal policies to be less effective than they might be in promoting military readiness. In many cases, chapter authors pointed to a lack of empirical evidence altogether.

- **Magnitude**
- **Practical Significance**
- **Changes Over Time**
- **Effects of Selection Process**
- **Training and Practice**
- **Multivariate Perspective**

Table 1. *Factors to consider in a constructive analysis of sex differences.*

More important, however, it was the goal of this chapter series to describe a more constructive approach to the analysis of sex differences. Whereas the first step was to summarize empirical evidence for sex differences, the second step was to consider factors that would facilitate a productive interpretation of those sex differences. These factors are summarized in Table 1, and are described in the following sections. (a) First, what is the magnitude of the difference between the sexes? The magnitude of the sex difference must be interpreted in relation to the variability among women and that among men. (b) Second, what is the significance of the sex difference, if any, for military operations? (c) A third consideration, highlighted by many chapter authors, is the importance of considering the extent to which sex differences change over time. Is an observed sex difference dependent upon the historical context or the developmental stage, for example, in which the observation was made? To the extent that this is true, the generality of such observations is limited. (d) Another factor that may limit the generalizability of the empirical literature on sex differences is the population studied. Factors mediating the selection of individuals into the military--characteristics affecting self-selection as well as the selection criteria imposed by the military--determine the characteristics of the military population. On many dimensions, the military population is not representative of the civilian population. Thus, empirical studies of civilians may not be applicable to the population of military women and men. (e) It is also necessary to consider whether an observed sex difference is immutable or modifiable. Several examples emerged from the review of the empirical literature to suggest that practice or training may diminish the magnitude of an observed sex difference. (f) Finally, and most important, does the empirical evidence for sex differences suggest more effective ways of eliciting maximal performance from military women than imposing conditions found to elicit maximal performance from males? Many of the questions that arose in the review of the empirical literature resonate with those that emerged from discussions with military personnel during the conduct of this project (see Ursano et al., Volumes I - IV, for transcripts of those discussions).

Magnitude of the Sex Difference

In an effort to evaluate sex differences in the effects of the environment on health and performance, it is important to establish whether there are sex differences in exposure to relevant environmental conditions, or in the response to those conditions. Depending upon the measure of environment or response, this question may be posed in terms of a sex difference in prevalence, or in terms of an average difference in scores for women and for men. That is, for a noncontinuous, or dichotomous, variable (e.g., diagnosis of posttraumatic stress disorder), one would ask whether there is a difference in the likelihood of diagnosis for women and men. For a continuous, or quantitative, variable (e.g., performance of a cognitive task), the question would be whether the average score of women differs from that of men. As a first step in evaluating the significance of an observed sex difference, whether in a noncontinuous or continuous variable, it is important to know the magnitude of the sex difference.



Figure 2. Schematic of frequency distributions representing hypothetical sets of scores for two groups. On the left (a), two closely overlapping distributions are shown. Although, in this example, group differences may be statistically significant, group membership is of little predictive value, as the variability in scores within each distribution exceeds that between the two. On the right (b), two distributions characterized by minimal overlap are shown. In this case, group differences may be statistically significant and group membership may be of some predictive value in operational settings as well. Even in (b), however, there is substantial within-group variability in scores. Factors accounting for that variability need to be considered. Moreover, the significance of between- or within-group variability to the performance of military assignments should be assessed. In some cases, individual or group differences may be of little practical significance.

Reflecting the empirical literature, the chapters in this volume describe data that confirm the existence of sex differences in some but not other domains. The magnitude of an observed sex difference, however, must be interpreted in relation to the variability

among women and that among men. A graphic illustrating this point for a hypothetical continuous variable is presented in Figure 2. Sex differences are most accurately interpreted as distributions of scores--one distribution representing scores of women and one representing scores of men. The degree of overlap of those distributions is the most salient characteristic of the picture.

Similar to the distributions depicted in (a), for example, the overlap of the distributions of scores representing performance of cognitive tasks by women and men is substantial. This suggests that it may not be useful to consider whether an individual is a woman or man when assigning cognitive tasks. In contrast, distributions representing upper body strength for women and men more closely parallel the graphic in (b). It is likely that more men than women will be able to accomplish tasks requiring considerable upper body strength. Even in (b), however, there is substantial within-group variability in scores. Only a fraction of men will be able to accomplish such physically demanding tasks.

Thus, factors other than gender that account for within-group variability in performance need to be considered. Moreover, the significance of within- or between-group variability to the performance of military assignments should be assessed. In some cases, individual or group differences may be of little practical significance. When group differences exist, it is important to ask how distinct the frequency distributions need to be to justify policy decisions that would exclude women from occupational specialties.

Practical Significance

Thus, prevalence data provide a useful foundation for a discussion of sex differences, as do data bearing on average differences between women and men. It is important to keep in mind, however, the larger question of military effectiveness, and to address the implications of sex differences for the larger question--how can a maximally effective force be established and maintained?

Implications for effectiveness. Although describing the magnitude of a sex difference is a first step in evaluating its implications for military effectiveness, other factors must be considered as well. Epidemiological studies of drug abuse reveal, for example, that fewer women than men report heavy alcohol and drug use. Based on these prevalence data, one might conclude that alcohol and drug use is not a problem among women, and that, therefore, alcohol and drug use does not mitigate the effectiveness of military women. This conclusion would be unwarranted. Though fewer women than men report heavy use of alcohol and tobacco, a significant number of military women report heavy use of those drugs. Such substance use may affect the health and performance of military women in a myriad of ways, ranging from effects on reproductive health to those on performance on military assignments (Gabbay & Duncan, this volume). In fact, women have been found to be more vulnerable than men to the detrimental effects of alcohol on physical health. Thus, although military women report less use of alcohol and other drugs than military men, substance use may still diminish the ability of military women to perform assignments.

There are also sex differences in the performance of certain cognitive tasks--with men performing better than women on some tasks and women performing better than men on others. As Duncan & Gabbay (this volume) point out, the differences between men and women are small and the variability is great. Moreover, the relevance to military operations of the cognitive tasks employed in this research is questionable. Consequently, the applicability of this research to the military situation is limited. Although the military has conducted a great deal of research on factors that affect cognitive performance (e.g., the effects of sleep deprivation on sustained attention) using tasks designed to be relevant to military operations, this research has focused on men. Little is known about the effects of stress on the performance of women on tasks of specific relevance to military operations.

Validity of the outcome variable. The significance of empirical evidence of sex differences to military operations will depend in part on the outcome variable employed in the research. Studies of response to stress provide a salient example of this point. Generally, studies examining response to stress focus on one domain of assessment (e.g., self-reports of stress response, or cardiovascular reactivity to stress). Whereas some findings of sex differences have emerged from these areas of research, the implications of those findings are not clear. Often, women are found to report higher levels of stress than men in response to trauma, as well as greater amounts of anticipatory stress. It is not clear, however, whether such reporting comprises an adaptive or maladaptive response to stress. Similarly, there is some evidence that the autonomic response of men to some stressors is greater than that of women; the significance of that sex difference also is not established. Research is needed, therefore, that investigates the implications to health and performance of variability in self-reports of stress and in autonomic reactivity to stress.

Scientific vs. practical significance. An important focus of the scientific literature on sex differences, particularly laboratory-based research, is the elucidation of the biological, psychological, and cultural bases of sex differences. Sexual dimorphism in the brain is well-documented. Sex differences in behavior most likely result from an interaction of gender-role effects with those biological differences. Scientific research seeks to define the biological and gender-role effects, and to understand the ways in which they interact to produce sex differences in behavior. Conversely, sex differences in behavior may provide clues for understanding of brain function. The importance of understanding the etiology of behavior should not be underestimated. It is a separate issue, however, whether sex differences in the laboratory have implications for health and performance in the field, including the military arena.

Changes Over Time: A Dynamic Perspective

The majority of empirical studies bearing on sex differences are cross-sectional. The focus, that is, on differences between women and men at one point in time. Accordingly, changes that occur during the evolution of a society, as well as changes that occur within the lifespan of an individual often are not considered in interpretations of these sex differences. The environment in which sex differences were observed--the hormonal, psychological, and sociocultural environment--may affect the interpretation of those sex differences and should therefore be considered.

Historical approach. An historical perspective provides an effective framework within which to consider the roles played, and the stresses faced, by military women. At the beginning of World War II, for example, women entered the military to take the place of men moving into combat roles, and returned to more traditional roles when the war ended. There was concern, following the end of conscription, about the ability of the military to recruit in sufficient numbers; accordingly, significant changes in the role of women in the military followed on the heels of the change to an all-volunteer force. Evolution to a techno-military will have an as-yet-undefined effect on the role of women in the military in the 21st century. An implication of the historical perspective is that sex differences--actual or perceived--based on past observations may be of limited relevance. As described by Holloway, for example, the image "soldier" in the minds of military leaders often is derived from past experiences. Those images, therefore, may be of limited validity in the existing environment. Moreover, their validity may be diminished increasingly as the military moves into the 21st century battlefield.

Tobacco use provides an example of the effect of changing sociocultural influences on sex differences in health-related behavior. As taboos against tobacco use in women lifted, cigarette use among women, particularly young women, increased relative to that in men. As this "gender gap" diminished, women were exposed in increasing numbers to a powerful environmental toxin. In consequence, the prevalence of tobacco-related illnesses increased among women relative to men. A view of sex differences that fails to take into account such temporal changes misinforms efforts to predict and intervene.

Developmental considerations. Within a single lifetime changes occur with time, driven by biology and context, and those changes also can modify differences between the sexes. Individual strengths and weaknesses--or resiliencies and vulnerabilities--may wax and wane over the life cycle as a result of biological, psychological, and sociocultural events. A military career progresses through stages across the life-span. Thus, a developmental perspective further enlightens our understanding of sex differences. Events that may modulate environmental effects on health and performance include, but are not limited to, endocrinological changes associated with reproductive cycles and events, attitudinal changes accompanying life events such as marriage and childbirth, and age effects on cognitive performance.

Recurring rhythms. Superimposed upon the larger cycles within a lifespan are more rapidly cycling rhythms, cycles that recur repeatedly within a single lifetime. The biologically-driven hormonal rhythms, such as menstrual cyclicity and seasonal variation in testosterone levels in males, are among such influences. Cyclic variation in estrogen and progesterone in women is thought to modify stress reactivity, for example. In men, testosterone levels vary across the seasons, such that peak testosterone levels occur in the autumn, and the lowest levels occur in the spring. The effects of this circannual rhythm are not known. Ultradian rhythms, or the seasonal variation in hours of light per day, which are known to affect mood and cognition, provides another example of an external environmental event that effects behavior. Little is known about the effects of these cycles on sex differences in health and behavior.

Effects of the Selection Process

A well-accepted doctrine from the field of developmental psychology provides an important vantage point from which to view sex differences: individuals play a role in both selecting and shaping their environments. This perspective highlights the importance of self-selection of women and men into the military and into various military subpopulations. Similarly, formal selection criteria are imposed by the military, limiting further the variance in some characteristics within the military population. Whereas the formal selection criteria are well-specified, permitting systematic study of their effects, the characteristics influencing self-selection into the military are more elusive.

When considering differences between civilian and military populations (e.g., in the prevalence of suicide or drug abuse), it is important to ask whether the military population is representative of the civilian population on dimensions relevant to any trait being considered. Do differences in drug use between military and civilian populations, for example, suggest that there is something about the military condition that protects against (or facilitates) drug use, or is the military population characterized by a diminished (or increased) vulnerability to drug abuse? A second example is described by Holloway (this volume). The violence rate for Blacks in the military is approximately 500 percent lower than it is for Blacks in the civilian environment. It is not clear whether this is a function of the differences in the characteristics of Blacks who enter the military compared to those who do not, or is there something protective about the military environment?

Thus, another factor that may limit the generalizability of the empirical literature on sex differences is the population studied. Empirical studies of civilians may not be applicable to the population of military women and men.

Training and Practice

It is too often assumed that observations of individual or group differences reflect immutable processes. When this question has been asked empirically, it has more frequently been found to be the case that individual differences can be overridden by training and practice.

A clear example of the mitigation of sex differences by training is provided. Although women report greater levels of stress in anticipation of bodyhandling than men, following training and experience with body handling, the sex difference in anticipatory stress evaporates. Similarly, Duncan and Gabbay (this volume) report that sex differences in cognitive performance may be overcome by practice on the task.

As with self-selection into the military, training comprises a powerful variable in determining sex differences. This variable has rarely been studied systematically, however, particularly in operational settings.

A Multivariate Perspective: Eliciting Maximal Performance

Individuals face environmental challenges with unique sets of strengths and weaknesses, resiliencies and vulnerabilities. Throughout the duration of this project, those familiar with military operations confirmed that military personnel are "a resilient bunch." In most cases, the challenges imposed by the demands associated with combat, deployment, contingency operations, and trauma are effectively met. Upon closer scrutiny, coping strategies range in effectiveness. That is, in some cases, due to an extreme environment, and/or to individual vulnerabilities, coping may not be maximally effective. Alternatively, the price of coping effectively with one stressor may be diminished effectiveness later in time, or in another domain. The notion of individual differences in strengths and vulnerabilities has been employed fruitfully for over two decades in the field of developmental psychology, and in the study of mental health and psychopathology. This model encourages definition of the factors that modulate individual resilience and vulnerability, strengths and weaknesses, over time and in various contexts. Identification of these factors may permit modification of components of the military environment most likely to challenge the resilience of individuals and disrupt effective performance. Specifically, an understanding of these factors could inform the reconfiguration of tasks, direct the modification of equipment, guide the development of stronger training programs, and stimulate the evolution of more effective leadership styles. An approach that takes into account sex as one of many variables that may affect health and performance, therefore, will be most productive.

Military Readiness

It must always be acknowledged that there is danger in bringing up the issue of sex differences. This discussion may provide fodder for those who would limit the assignment of military occupational specialties on the basis of gender. Although important to mention, this argument is not deserving of elaboration in this context. To limit the acquisition and distribution of knowledge that might permit more effective use of the forces, out of deference to a few who will misinterpret and misuse that knowledge, is inconsistent with the goal of this enterprise.

Military readiness is the ultimate goal. Any action that does not have readiness as its final goal, whether legislatively- or policy-driven, whether arising from a cultural, subcultural, or individual attitude, is distracting at best, pernicious at worst. The question is how to compose the force for maximal performance and how to maintain effectiveness. This purpose cannot tolerate misguided beliefs about the factors mediating individual differences. Rather, the "science of sex differences," as touched on in these volumes, should be studied and expanded to provide more sophisticated guideposts for the composition and maintenance of a force that effectively utilizes women and men.

This situation is not without parallel in civilian society. Responses to the integration of women into the American workforce have ranged from complete denial of sex differences, to the exclusion of women on the basis of a superficial analysis of sex differences. Whether in the academic or corporate world, it should be considered that

failing to adjust the system to accommodate individual and group differences may limit the productivity of society. As long as performance and effectiveness are the basis for evaluation, the integrity of the system is not threatened by such adjustments. Major General Jeanne Holm (1992) refers to the integration of women into the military as an "unfinished revolution." Society will benefit from carefully observing as women are integrated more completely into the military.

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