LEADER ATTITUDES TOWARD PREGNANCY IN THE MILITARY AND FEMALE INTEGRATION INTO FORMERLY CLOSED UNITS

by

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DEDICATION

This project is dedicated to the Soldier-Moms who struggle to balance their careers and families, and their social support network that makes it all possible.

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ABSTRACT

LEADER ATTITUDES TOWARD PREGNANCY IN THE MILITARY AND FEMALE INTEGRATION INTO FORMERLY CLOSED UNITS

Sarah J. McCreight, M.S., 2016

Thesis directed by: Tracy Sbrocco, Ph.D., Department of Medical and Clinical Psychology

Background: There is a limited body of research examining Army leaders' attitudes toward pregnancy in the military (particularly under the current requirement to integrate female Soldiers into all previously closed military occupations) and their perspectives on Pregnancy and Postpartum Physical Training (P3T), a fitness and education program for pregnant and postpartum active duty Army Soldiers. Previous research on military pregnancy has been limited to examining the potential impact on readiness and unit cohesion from peer perspectives, workplace concerns from the pregnant Soldiers' perspectives, and pregnancy planning and timing related to access to contraception. The Army Public Health Center (APHC) has evaluated P3T, but has not assessed the attitudes of leaders as a stakeholder in P3T outcomes. P3T relies heavily on the buy-in of leaders for its implementation because it operates at the installation level or lower. Understanding leader attitudes about P3T may help understand more about the variability of success of the program Army-wide. Additionally, as the military integrates women into formerly all-male units by January 2019, leaders' attitudes toward P3T and

military pregnancy are needed as a means to better understand the culture in which potentially pregnant women will be integrated. **Purpose of study:** This purpose of this study was to test a measure for consistency and use it to describe leaders' attitudes toward military pregnancy with regard to impact on readiness and compatibility with active duty service, and leaders' views on the P3T mission and outcomes. This study aimed to examine if these attitudes differed by occupational specialty while controlling for potential confounds. **Method:** A sample of 657 participants were recruited using snowball and convenience sampling through social media. Participants were Army enlisted members and officers who served on active duty, or in the National Guard or Reserves, within the past year. All respondents were over the age of 18 and included commanders, other leaders, and non-leaders at company grade and above. Participants completed three self-report measures, including the Army Leaders' Pregnancy Attitudes (ALPA) survey, developed to evaluate views on pregnancy and P3T, the Impression Management subscale (IMS) of the Marlowe-Crowne Social Desirability Scale to assess socially desirable responding (SDR), and the Modern Sexism Scale (MSS) to measure sexist beliefs (31; 162; 182). **Data analysis:** Principal components analysis (PCA) was conducted to reduce the number of variables of the ALPA into components, which were then used to describe leaders' attitudes toward the following: military pregnancy, pregnancy stigma, pregnancy impacts on readiness, and policies for pregnant service members. Multiple regression was used to evaluate leaders' attitudes toward pregnancy (as approximated by sum of factor scores) with occupational specialty as a predictor. Other variables in the model included leaders' parental status and gender, percentage of female personnel and percent pregnant/postpartum personnel in the unit, socially

desirable views (as measured on the IMS) and sexist views (as measured on the MSS). Logistic regression was used to evaluate leaders' familiarity with P3T by occupational specialty. Multiple regression was used to evaluate the relationship among leaders' views of P3T reach and implementation, and P3T outcomes. **Results:** Data were collected from 657 participants who were predominantly female (65.7%), Caucasian (72.5%), and non-Hispanic (90.9%), junior officers (36.6%) in Force Sustainment jobs (37.4%), who were also parents (75.7%). PCA yielded eight components with good internal consistency (α = .71) for the ALPA, and a two-component solution with good internal consistency (α = .87) was attained for P3T subscale items. Occupation was not associated with pregnancy attitudes as estimated by the sum of ALPA factor scores. It was also not associated with attitudes toward the impact of pregnancy on military readiness, attitudes toward pregnancy stigma (as estimated by component score), or attitudes toward gender integration readiness (as estimated by factor score). Gender, parental status, SDR, and sexist beliefs were strongly associated with pregnancy attitudes. **Conclusion/Discussion:** Disproportionately, women who were parents responded to this survey, suggesting it is of great interest to those with vested interest. No differences were noted between occupational specialties regarding attitudes toward pregnancy, gender integration, or other factors. However, gender was strongly associated with these attitudes, possibly attributable to the disproportionate response by female service members. Open-ended responses suggest other factors are of future interest, such as sexual assault prevention, leader buy-in to integration, and physical standards equally applied to both genders.

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HISTORY OF WOMEN AND PREGNANCY IN THE U.S. MILITARY

Women have served in a variety of roles throughout American military history. Their proportions have varied over the years, as have the capacities in which they served. Women have also become mothers, and have balanced motherhood and service. A brief history of women and pregnancy in the U.S. Armed Forces follows.

Female Composition of Active Duty Service Members

Women comprise 15% of the total military force, with each service branch having different proportions of female members (36; 39; 40). Women account for 16.3% of the total U.S. Army, which includes 14% of the active duty, 23% of the Army Reserve, and 16% of the Army National Guard components as of the end of fiscal year 2014 (61). Many of these women are also starting or growing their families. Between 2001 and 2010, an average of 15,600 live births occurred among active duty female service members each year, and it is estimated that over a five year span as many as 35% of female service members will become pregnant at least once (5; 16). The number of births among active duty women appears to be on the rise, as the average live births increased to approximately 17,000 per year from 2006-2014 (6). Generally, the number of pregnant Soldiers represents fewer than 4% of the total fighting force at any given time (5; 39; 40).

Roles for Military Women

Women's roles in the military have continued to expand over the past four decades, with increasing leadership opportunities, opening of career fields formerly reserved for men, and changing policies to improve opportunities for women to advance

their military career (13; 86). As of 2014, 78% of job positions were open to female Soldiers, though women served in 95% of all Army occupations (61). Multiple groups have studied the gender gaps in Officer retention and career progression, as well as the changing "battlefield" and unit organization, and determined that the assignment policy prohibiting women from serving in combat roles should be eliminated (10; 34; 85). Based on these recommendations, policies have more recently been introduced to increase the military role of women, to include assignment to all occupations previously closed to women, beginning by January 2016 (42; 43; 128-131).

Challenges for Female Service Members

Women in the military face a variety of possible challenges, including sexual trauma and harassment, issues with dual-military marital status and deployment, genitourinary health concerns, environmental exposure to potentially hazardous materials during reproductive years, mental health concerns, and women veteran's health issues (10; 15; 102; 124; 126; 127; 136; 161; 167). Among these potential concerns include reproductive issues, such as unintended pregnancy, pregnancy while on deployment, and access to contraception while serving (2; 27; 28; 80; 81; 108).

In today's military, most active duty women who become a parent find that pregnancy and parenthood are compatible with continuing their military careers (14). From the military policy perspective, however, this has not always been the case. Until the start of the All-Volunteer Force (AVF) in 1972, servicewomen who became pregnant were released from military service (41; 46; 49; 50; 64; 65). The military of today aims to retain these highly qualified professionals and is less likely to release pregnant women from service unless it is mutually beneficial to the service and the service member (45).

Given that the goal of retention is a high priority, Soldiers who become parents while serving on active duty must develop a set of skills that enables them to balance the demands of military service and parenthood. The Soldier's capacity to adapt to the role of Soldier-Parent depends on factors from both the individual's cultural background and on the environmental culture of the military.

Women in the Military Culture

A variety of factors influence women in the military, based on the overlap of cultures – the culture in which these women lived prior to military service and the military culture. The cultural overlap is not dissimilar from the social ecological or systems development model first discussed by Bronfenbrenner in 1977. In his original model, Bronfenbrenner stated that the individual develops in the context of his or her set of social ecological systems, comprised of a microsystem (e.g., immediate family members, friends, and small social group), mesosystem (the interacting relationship between the small social structure and community), exosystem (e.g., community or local government/policy), and macrosystem (e.g., larger cultural group, public policy, and law).

The systems in which a military woman finds herself, however, may include several overlapping systems rather than a single developmental set of systems as discussed by Bronfenbrenner (17). Socio-cultural development continues across the lifespan and may be influenced by the integration of new social systems, such as the military system. The military culture (exosystem) also defines the broader aspects of how a servicemember develops professionally during his or her career. Within the military culture are policies at major commands within each branch of service (macrosystem) that

interact or relate (mesosystem) to the servicemember's small unit command and members within the unit (microsystem).

However, the servicemember is impacted not only by the social ecology in which he or she works (as in the case of the Army), but also in the social ecology in which he or she was raised or currently lives. A depiction of this phenomenon, which is an adaptation of Bronfenbrenner's work, is in Figure 1.

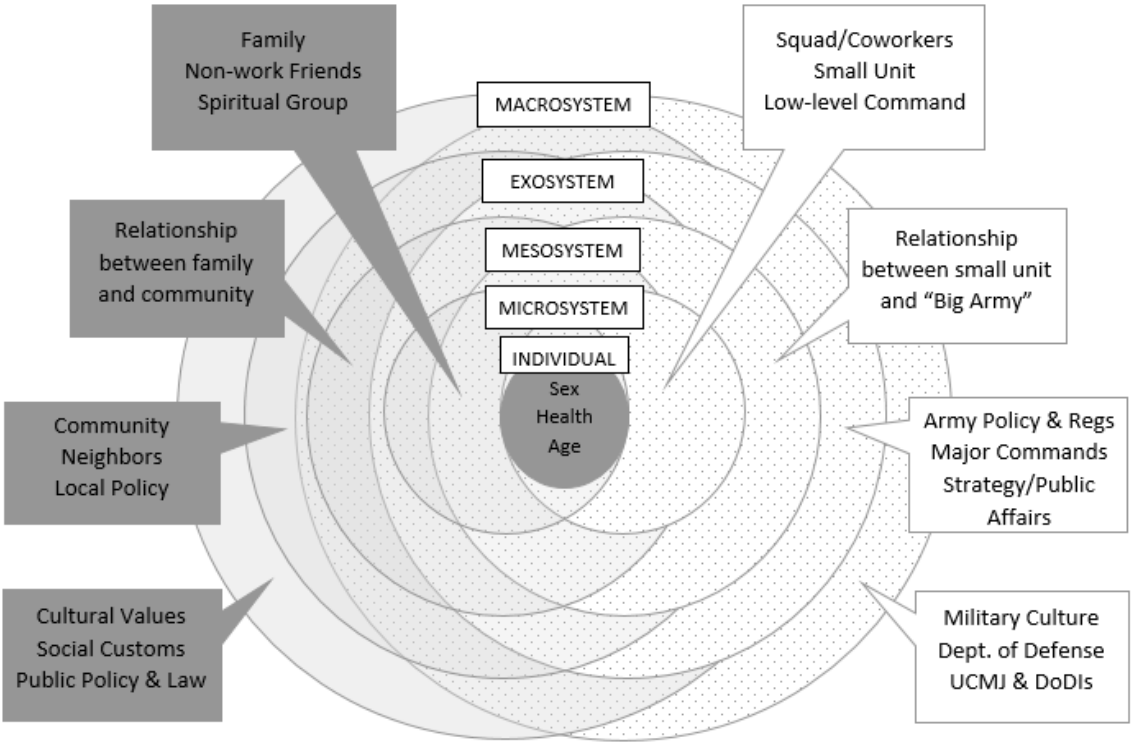

Figure 1. Social Ecological Model of the Female Service Member.
Two overlapping social ecological systems in which female service members operate. The original developmental system and associated culture is shown on the left, while the military system and associated culture is shown on the right. Model is adapted from Bronfenbrenner (1977).

This culture and belief structure within the female service member's military systems are currently in a phase of great change, given the requirement to integrate female service members into occupations formerly closed to women (13; 42; 43; 128-

131). This study examines the attitudes of the leaders closest to the individual female Soldier – the military microsystem – as shown by the small unit and command. Implications from the findings, however, may yield evidence about the exosystem (Army policies and larger command operations) or even the macrosystem of the military culture at large. For example, views of commanders within the microsystem may relate directly to current Army assignment policies (which are currently under revision). These policies potentially impact women who are pregnant or intend to become pregnant while serving in Operations Division (formerly known as Combat Arms) assignments. As a greater understanding of the issues develops, impending policy changes regarding assignment of women may reveal a need for intervention among leaders and policymakers at the macro level to ensure policy changes reflect the needs of both male and female Soldiers.

More recent research on military women and the various contributors to (and detractors from) their well-being also suggest resources, external influences, social pressures, internal drive, and a variety of other factors and outcomes contribute to a female service member's well-being (155). Like the adapted model from Bronfenbrenner's original research, the person's functioning is considered in context (17; 155). The model as depicted in Figure 1 depicts the overlap that military culture has on the individual, which is not a complete eclipse. Thus, a service member's unit and command climate not only exerts an external pressure, but can also be incorporated into the Soldier's way of life.

The Changing Roles of Women in the Military and Implications for the Organization

The proportion of women serving in the U.S. Armed Forces has steadily increased from approximately two percent in the early 1970s to the 15% on active duty today (40;

61; 154). Additionally, occupational specialties available to women began to shift from the "traditional" roles in health care, transportation, and administrative duties to more "non-traditional" roles (154). Prior to World War II, women served almost exclusively as nurses, or in administrative and communications jobs. Wartime necessitated the expansion of women's roles to more traditionally masculine jobs such as mechanic or parachute rigger (154). Post-World War II saw a return of women to the traditional, feminine jobs, but by the beginning of the AVF in 1972, women were employed in a variety of these non-traditional career fields (154). The trend to increase the breadth of roles for women in the military continues. This trend is likely associated with a growing body of research that demonstrates women are capable of serving in a variety of capacities, that their service has positive impacts on the units in which they serve, and that denying them some of these careers potentially impacts retention (35; 73; 85; 86; 104; 134; 144; 189). In 2013, then-Secretary of Defense Leon Panetta paved the pathway to opening all career fields to female service members by January 2016, with full integration completed in a three year period (13; 42; 43). In the years since Mr. Panetta implemented the graduated plan to eliminate the 1994 Ground Combat Exclusion rule for assignment of female service members, occupations increasingly opened to women in advance of the January 2016 deadline (13; 42; 43; 128-131). Now that the integration process has begun, ongoing changes in roles for service women make it essential to analyze the potential implications female role expansion has on the total force. Some studies have taken the perspective to analyze how fellow male Soldiers will adapt to these changes, as well as assessing the experience of females who have joined these formerly all-male units (70-72; 83; 189). Results of the Army Training and Doctrine Command

(TRADOC) Analysis Center (TRAC) study on gender integration was close-hold and not widely distributed, though it did indicate pregnancy as a major concern with regard to integration (179). However, no published studies have explored leaders' attitudes toward gender integration and the sometimes-associated considerations such as pregnancy.

The impact of pregnancy and parenthood in a military environment became more of a widely-recognized issue with the start of the Persian Gulf War, as it was the first time women (many of whom were also parents to nursing infants and young children) had deployed in large numbers in U.S. military history (184). Indeed, the non-deployable rate for women (preventing service members from deploying in support of combat operations) during the Persian Gulf War was three times the rate of their male counterparts (140). Following the Persian Gulf War, research began to focus on the increased prevalence of fertility issues, poor birth outcomes, and birth defects among service members who were deployed in support of Operations Desert Shield and Desert Storm (9; 68; 96; 187). Research on military pregnancy during the Afghanistan and Iraq wars steeply declined, and focus began to shift toward mental health concerns (124).

Over the span of the last few decades, some attention has been given to the impact of pregnancy on the military organization. Specifically, research on the organizational impact of military pregnancy has focused on the effect of pregnancy on unit operations and mission readiness, and on unit morale and cohesion (14; 19; 70-72; 135). Additionally, the prevalence of unplanned and single-parent pregnancies has been a recurring interest because of the high prevalence in military populations as well as the potential for the impact on mission readiness (2; 27; 81; 87; 108; 133). Research on several aspects of military readiness (including recruiting and retention) in the context of

military pregnancy is scarce. The Army requested a RAND study to evaluate the impact of the numerous quality-of-life programs funded by the Army on Soldier recruiting, retention, and readiness (158). Major findings of the RAND report were that research was limited, needs assessments were inadequately matched with the proposed outcome measures, and that "readiness" was defined too broadly or that definitions did not align between the strategic mission of the Army and the research being conducted (158).

Research on military pregnancy to date has generally only explored the beliefs and attitudes of subordinates within military units, or the pregnant service members themselves, and has largely neglected to address the insights of leaders at the command level. Results of this literature will be addressed in subsequent sections. Commanders are responsible for accountability of all personnel, assets, and resources assigned to their units, and for effectively managing these personnel and assets to meet mission requirements. Leaders' attitudes toward military pregnancy and female integration may impact the behaviors and attitudes of subordinates, how pregnancy is managed, the command climate, potential clemency of gender discrimination, and more. The proposed study investigates the potential organizational impact of pregnancy among active duty Army women from these leaders' perspective. Such information may be useful to inform programs and policy related to the management of pregnancy in the military of the future.

There is a gap in existing literature due to this exclusion of a major stakeholder in management of military pregnancy. At a minimum, efforts should be made to better understand the views of leaders to determine what, if any, needs are present with regard to health education, personnel management, discrimination or harassment, or policies that may be adversely impacting the work-family dynamic in military units. In the long run,

having a grasp on the viewpoints of military commanders can pave the way for comprehensive policies supporting both the pregnant servicemember and the whole unit, development of prevention measures to limit the adverse impacts of military pregnancy on operational readiness, and implementation of interventions designed to improve the overall health and well-being of the pregnant service member and her work environment.

This study specifically evaluates leaders' attitudes toward pregnancy in the military in the context of the requirement to integrate women into all career fields by January 2016. It is important to obtain leaders' views on potential impacts of pregnancy on unit readiness, possible training needs to better prepare Soldiers for the integration process, and perceived value of current policies and programs supporting pregnant and postpartum Soldiers. Issues related to supporting pregnant service members are reviewed below.

Mission Readiness, Deployability, and Operational Tempo

Mission readiness, the deployability of the unit, and the operations tempo (OPTEMPO) of a unit are all ways to describe how units become prepared to deploy in support of global missions. OPTEMPO describes the pace or frequency (tempo) of operations (24). It can also describe the pace at which a unit becomes deployable. The tempo in a garrison environment is much slower than in a training cycle, in which units are preparing for operational exercises or deployments (24). For example, a unit in preparation for deployment will have a high OPTEMPO, consisting of conducting mission readiness exercises (field training with all assigned personnel and equipment, using mock wartime scenarios). A unit that is in reset phase (post-deployment) in garrison, will have a low OPTEMPO, consisting of conducting maintenance on assigned

equipment and allowing for special training opportunities or personal leave for assigned personnel.

Mission readiness is defined in many ways. According to the Chairman of the Joint Chiefs of Staff (CJCS), mission readiness can be described in terms of operational, strategic, or tactical levels (25). Specifically, operational readiness is defined as, "Combatant Commanders' ability to integrate and synchronize ready combat and support forces to execute assigned missions" (25). Strategic readiness is the requirement for joint forces to be prepared with capabilities to accomplish more global-oriented missions, while tactical readiness focuses on capabilities at the unit level such that commanders can execute missions for which their units were designed (Ibid.). Most simply, mission readiness is having the personnel and resources ready and available to complete the unit's assigned mission.

In the Army, mission readiness is reported monthly and is based on factors such as staffing (to include deployable status), equipment on-hand, and training (52). Units report their status regardless of whether they are in a non-training (garrison) OPTEMPO or are preparing for deployment (Ibid.). Pregnancy, like other medically-limiting health status, can impact overall unit readiness with regard to deployability of its total force (19; 135). There has been a long-standing bias that women are less deployable than their male counterparts, specifically due to pregnancy and parenthood (154). However, the most common non-deployable reason for Army personnel was injury (31.5%), with pregnancy accounting for 7.3% of non-deployable personnel during the 12 months preceding the 2011 Health-Related Behaviors (HRB) Survey of Active Duty Military Personnel (11). Commanders may feel pressured to improve their mission readiness status, particularly

when OPTEMPO is high and deployment is pending for their units. Any non-deployable Soldier who is assigned to a deploying unit prevents a deployable Soldier from being assigned because Army assignments are need-based, according the number of personnel each unit is allowed to have (53). Because pregnancy is a deployment-limiting condition, leaders may thus perceive Soldiers' pregnancies as detrimental to their ability to maintain operational readiness for deployment. However, there is no scientific literature on how commanders and senior leaders perceive pregnancy with regard to mission readiness. Given Army leaders' influence on the environment in which their subordinates work, it is invaluable to assess leaders' attitudes in advance of the requirement to integrate female service members across all occupations. If a culture change is necessary to successfully implement female integration, these leaders will be most influential in catalyzing that culture change.

Now that the 1994 Direct Ground Combat Definition and Assignment Rule (alternatively known as the "Combat Exclusion Rule") for female assignments has been rescinded, female service members will soon fill Military Occupational Specialties (MOS) vacancies across all four major occupational divisions – Operations, Operations Support, Force Sustainment, and Health Services (13; 173). This change is particularly relevant to the Operations division, which houses most of the MOS that were formerly closed to female service members (173). Formerly known as Combat Arms, the Operations Division (OD) includes Infantry, Artillery, Armor, Special Forces, and other units that have very few jobs open to women already (173). With all jobs open to women no later than 1 January 2016, OD units may soon begin to experience a new potential impact to overall unit readiness – pregnant Soldiers (13). For this reason, it is also

important to understand leaders' attitudes and concerns regarding the impact of women and, more specifically, the impact of pregnancy on unit readiness.

Leaders in OD units may hold certain beliefs or concerns about welcoming female service members into their units, which potentially impact how these women are treated by their colleagues, how they are assigned within units, or how they may be evaluated or promoted differently from their male peers. If negative attitudes are present among the leadership, higher-level Army decision-makers need to be aware of what these attitudes are so that they may be properly addressed. Understanding more about these attitudes may lead to improved education of commanders and supervisors of women, which may lead to an improved work environment overall. Additionally, commanders in these units are likely more familiar with potential concerns about risks, environmental or occupational hazards, or other concerns about female service members within their units. If these concerns are not brought to light, Army decision-makers may be unwittingly increasing risk of harm to an entire group of service members.

Previous research on the integration of female service members into formerly all-male occupational specialties occurred in the 1990s, after the last major change in female assignments. Findings from a large, albeit dated, study in 1997 on the integration process suggested that mission readiness was not significantly impacted by female integration into previously all-male units (86). Further, both men and women perceived that female work performance was commensurate with that of their male counterparts (Ibid.). However, in units with a high density of pregnant female Soldiers, or in units that were already understaffed, pregnancy was found to adversely impact mission readiness (Ibid.).

Part of the debate on whether pregnancy impacts overall readiness can be attributed to the way in which readiness is measured. Just as there are various definitions for readiness based on the level of warfighting being described, readiness as measured at these levels will also differ (25). When evaluating readiness from an overall service perspective and excluding deployable status, pregnancy has virtually no impact on readiness (19; 135). However, when individual units internally evaluate their readiness, the story is different. When units are understaffed or preparing for deployment, the perspective that pregnancy impacts readiness increases; when units are fully manned and/or conducting garrison (non-deployed) operations, pregnancy is not viewed as any more detrimental to unit readiness than any other deployment-limiting condition (19; 86). These findings represent the views of individuals within the units and not the views of commanders and other senior leaders. For better or worse, leaders' attitudes are commonly reflected in the attitudes of their subordinates. Given the dearth of knowledge about leaders' attitudes toward military pregnancy, this study aimed to investigate these attitudes, which may foster and maintain a similar set of attitudes toward pregnancy in the military culture.

Pregnancy Timing and Planning

Service women who plan their pregnancies around their units' OPTEMPO and mission status tend to experience more positive unit cohesion and social support within their units (71). This finding supports the idea that views of pregnancy change based on unit operational status and staffing requirements (19; 86). If, for example, a unit is returning from deployment and entering its "reset" phase, pregnancy may be viewed more favorably than if the unit were preparing for an upcoming deployment or major

exercise. As briefly mentioned in a previous section, when a unit resets, it returns to garrison (home base) operations and a lower OPTEMPO. During reset, individuals attend professional development courses in military leadership, take leave, address personal or family issues, and conduct more administrative functions within the unit. When a unit is planning to deploy, administrative functions are curtailed for more operational duties and an increased OPTEMPO. These duties often include trips to firing ranges, field training exercises, or mission-readiness (pre-deployment) exercises involving full scale rehearsals of the impending deployment mission. Planning of pregnancies during times that are more compatible with unit OPTEMPO are therefore more likely to be supported by the unit.

However, pregnancies are not always planned. Single service women are more likely to have unplanned pregnancies than their single civilian counterparts, and more than half of all pregnancies among servicewomen are unintended (108). Within the service, estimates of unintended pregnancy range from 105 to 115 per 1,000 births, as compared to about 51 per 1,000 of civilian pregnancies that are mistimed or unplanned (81; 108). Recently, Grindlay and Grossman (2013) found rates of unintended pregnancy to be highest among married (65% increased odds) and cohabiting (78% increased odds) servicewomen as compared to single service women. Additionally, age and education were predictive of unplanned pregnancies, which were more common among those who were younger and less educated (81). A study from 1996 found that married officers were more likely to have planned pregnancies, while younger, enlisted, single Soldiers were more likely to have unplanned pregnancies (70). Regardless, age and education have

consistently been a predictive factor regarding pregnancy planning in both the military and civilian populations.

The largest subgroup of women on active duty are in the youngest age category (17-24) and are most likely to have unintended pregnancies, similar to civilians of the same age group (81; 108). When adjusted for age, Grindlay and Grossman (2013) reported that the rate of unintended pregnancy among all military women is 50% higher (78 per 1,000 births) than among civilian women (52 per 1,000 births). These poorly-timed, "unintended" pregnancies may be seen by unit personnel as specifically intended to avoid deployment, but may also be a direct result of limited access to, and use of, contraception (28; 80). Even when access to contraception is potentially easily available, such as condom use, nearly 27% of females surveyed in the 2011 HRB survey reported never using a condom with a new sexual partner, and 14.3% of all servicemembers (male and female) reported two or more new sexual partners within the 12 months preceding the survey (11).

Contraception use among female service members is largely based on a core theme of taking responsibility (for their bodies and their careers), and is influenced by service members' knowledge, family values, and their support system (28). During or just prior to deployments, however, access to contraception appears to be limited. Grindlay and Grossman (2013) found that one-third of deploying female Soldiers were unable to access a preferred method of contraception on deployment, 41% were unable (or found it difficult) to obtain refills, and 59% did not even speak to a health care provider about contraception (80). During times of high OPTEMPO, mission focus takes priority over almost everything else, so seeking a routine medical appointment to obtain contraception

during pre-deployment is generally not practical. This limited access is potentially linked to the general order of abstinence from sex while in theater, but disregards other health reasons for contraceptive use on deployment, such as menstruation suppression (139). Other studies suggested that women's health care preferences (e.g., to see female health care providers, to ensure confidentiality), and perceptions of gender discrimination with regard to reproductive care all impacted women's access to, and use of reproductive health care options (117; 123).

While the military works to reduce overall unintended pregnancies, it is still beneficial to provide services for pregnant and postpartum service members for optimal health, recovery, and return to duty. The previous research on pregnancy timing and unit OPTEMPO from the mid-1990s only focused on the pregnant women's perspectives on unit morale, cohesion, and discrimination based on the timing of their pregnancy (71). Commanders' and other senior leaders' perspectives on pregnancy planning and timing are virtually unknown. Given that leaders set the stage for how the unit prepares for and responds to pregnancies, understanding leaders' views is critical in gaining insight about how pregnant service members are likely to fare in their units.

Occupational Health

One area that the Army has consistently developed policies benefitting servicewomen is in managing the occupational health of pregnant Soldiers. Pregnant service members in a variety of potentially hazardous occupations must be temporarily reassigned during pregnancy for optimal health of the mother and unborn child. The Army has very clear policies outlining the reassignment of pregnant Soldiers to reduce contact with fuels, toxic vapors from paints or solvents, excessive vibration, exposure to

carbon monoxide, and a variety of other occupational hazards (51). The Army Public Health Center cautiously generated an effort to rescind the requirement for pregnant and nursing service women, and those who are trying to become pregnant, from wearing permethrin-treated combat uniforms even in the absence of medical findings that permethrin may be harmful to a developing fetus or could cross into breast milk (59).

Reassignments during pregnancy were reviewed in Evans and Rosen's work in the mid-1990s (70; 72). Approximately 20% of pregnant women were reassigned during their pregnancies for a variety of reasons, the most common of which were hazardous materials risk or physical limitations. The majority of reassigned women agreed or strongly agreed that work reassignments were both necessary (80%) and meaningful (74%) during their pregnancies (70; 72). However, those reassigned were also more likely to report that they experienced harassment or discrimination. They also reported more psychological distress, medical problems, and absence from work, and were more likely to express intentions to seek discharge from the military (70; 72). It is important to understand how leaders decide to reassign their pregnant personnel, and how they continue to make those Soldiers feel supported and successful during their time away from their normal duties. Unfortunately, no empirical research has been conducted to identify Army leader attitudes toward reassignment or management of the command climate during subordinates' pregnancy.

Morale, Unit Cohesion, and Gender Integration

According to Rosen and colleagues (2003), unit cohesion can be described horizontally for peer cohesion (i.e., peer bonding, camaraderie, social support, and friendships outside of duty hours) and vertically (i.e., Soldier-leader bonds, Soldier

confidence in their chain of command, and presence of concerned leaders) for superior-subordinate cohesion (145). Morale is contextually-based, and one may find differing descriptions or definitions of morale based on the environment. Manning (1994) describes morale as "the enthusiasm and persistence with which a member of a group engages in the prescribed activities of that group" (p.1). In a military environment, morale by Manning's definition could be described as the degree to which a service member aligns with and pursues the same mission as his or her colleagues, as well as the amount of enjoyment or satisfaction the service member gains from this alignment (116).

Multiple factors likely influence the group cohesion of service members, though there is some disagreement about the most direct pathway to cohesion. Some have argued that social bonding is secondary to the collective and ritualistic movements (e.g., warrior tasks and drills or orchestrated attacks on military objectives), which are the "true" foundation of military cohesion (98; 100). Another argument is that cohesion is developed in multiple levels of social interaction, including both lateral/horizontal or peer relationships and vertical or command/subordinate relationships (100; 156). More recent research mirrors the multiple/social interaction argument, referring to task cohesion (shared commitment to reach a collective goal) and social cohesion, or emotional closeness within a group (112). The historically masculine environment of the military relied on the bonds of friendship between uniformed members and remains an important factor in unit cohesion today (97; 99). Research on disruption of unit cohesion became more relevant as the "Don't Ask, Don't Tell" (DADT) policy against openly gay service was repealed (112). As more women are integrated into historically all-male units, it has become increasingly important to evaluate the key components of unit cohesion and how

the integration of women impacts cohesion, if at all (98; 143; 156). Though no studies have linked a significant tie between gender and unit cohesion, strong opinions within the military culture suggest that only men are able to form the strong social bonds associated with small unit cohesion (98; 100; 112; 143-145; 157). This commonly held belief may be related to the concept of hypermasculinity.

Hypermasculinity is a term based on the hegemonic ideals of masculinity, and is frequently associated with physical dominance, aggression, violence, high emotional control and/or low empathy, and overt cis-gender male heterosexuality (90; 145). Military women are currently serving in a hypermasculine environment, in which gender stereotypes historically have dominated the roles of service members and can adversely impact military careers for women (4; 185). This stereotypical version of "maleness" can be a source of solidarity and cohesion among military men. In a study of all-male units and mixed-gender units, hypermasculinity was found to be positively associated with increased morale and both horizontal and vertical unit cohesion in the male-only units, but these findings were unable to be replicated in mixed-gender units (145). Increased hypermasculinity was hypothesized to negatively correlate to gender equality and positively correlate to gender discrimination in this study, as well. While significant correlations occurred in the hypothesized directions, there were no significant group effects for all-male versus mixed-gender units (145). Nevertheless, in a comparison of five studies on the integration of women into predominantly or exclusively male military operating environments (basic training, field exercises, and occupations), no study found the integration of women to be deleterious to overall unit cohesion (144).

A dated study from 1989 examining the effects of female spouse influence on male Soldier morale found that the spouses' attitudes toward the unit did influence Soldier morale and satisfaction with the Army (146). However, no similar study comparing partner influence on female Soldiers' morale has been conducted. Findings from a RAND study on female integration into formerly all-male units indicated that morale and unit cohesion were not significantly impacted by the integration of females (86). In fact, gender integration was cited as having a positive effect on unit cohesion, in that it tended to raise professional standards within the unit (86). Gender integration has been found to have no impact on the performance of male service members, but it has been shown to improve the performance of female service members when integrated with males (144). These findings are not consistent with more recent research, however. During the TRAC study on gender integration in the Army, every issue raised in focus groups and surveys were considered specifically in the context of morale, cohesion, and readiness (179). Furthermore, an ethnographic study of male and female Marines found that traditional gender stereotypes can influence perceptions of female Marine performance, socialization in the unit, camaraderie or cohesion, mentorship of female Marines, and a culture that perpetuates double-standards (4). While the Marine Corps is generally considered different from the other Armed Forces, the saying "Every Marine is a Rifleman" stands in stark contrast to the way their personnel are assigned – female Marines are leaders of male combat troops, truck drivers on the battlefield, and participate in combat operations – yet they are designated as "attached" to combat units rather than true members (4).

While the findings from earlier studies seem to suggest that gender (including the possibility of pregnancy) does not have a significant impact on morale and unit cohesion, no recent studies of gender in military culture have supported these findings. In fact, many individuals in military culture continue to be outspoken about the potential risks of female integration to morale and unit cohesion, as well as the standards by which all are trained (69; 143; 179). Indeed, public forums were clogged with opposing views about possible changes to standards or concerns about impact on morale as the first two female Soldiers trained and subsequently graduated from the U.S. Army Ranger School in August 2015 (104; 138). Much of the debate about female integration appears to hinge upon how women have performed over the past decade of wartime and how they may fit into the larger operational picture in the military of the future (134). The process to systematically integrate female Soldiers will take up to three years, and according to the Secretary of Defense, will do so without exceptions (22; 23). The Army has been internally reviewing and assessing the possible barriers to integration since 2011, only providing limited release of the results before developing its implementation strategy (62; 179). The earlier studies largely predate the post-9/11 changes that have occurred across the military and thus, the context in which the data were gathered may no longer apply. Additionally, these studies may not have accounted for the impact of social desirability on how individuals responded to questionnaires and interviews. The present study, however, took social desirability and impression management into account and included it as a variable.

Extensive research has identified that individuals respond according to socially desirable conventions in a variety of contexts (12; 31; 119; 181). Clear gender differences

have been found with regard to social desirability response (SDR) bias in ethical decision-making, for example. (12; 32). SDR may have contributed to the lack of disparate findings with regard to integration of women in the military, a male-gendered institution. Indeed, Swedish military officers have been found to respond in a more socially desirable way to personality measures than civilian college students (165). SDR has also been found to be associated with higher commitment to continued work at an employing organization (12). In a review of studies that controlled for SDR, about half of respondents to self-report measures were found to demonstrate SDR in their answers (181). It is therefore possible that SDR contributed to the findings in previous research on gender integration and its effects on morale and unit cohesion.

In Thunholm's (2001) research with the Swedish military, he posited that the need to "look good" may be more prominent among military officers, whose roles include being the face of their units or representations of the military to outsiders (165). The role of leaders and their beliefs, policies, and practices may have a much larger impact on unit cohesion and overall morale within the unit. In previous research, leadership and training were found to be more significantly associated with morale and unit cohesion than the mere integration of females into formerly all-male units (86). Indeed, it has been suggested that vertical cohesion has a strong influence on horizontal cohesion over time (145). Unfortunately, little research has been conducted regarding the leadership views on pregnancy and female integration in the military, and how these factors potentially impact unit cohesion. This study aimed to identify and describe these leaders' views, with an added measure to limit potential confounds resulting from SDR.

Single Parenthood, Women, and Retention

Recruiting and retention of female service members has historically been difficult due to the disproportionate number of males-to-females in the military, advertising that was not targeted at females, disproportionate promotion rates, a "glass ceiling" effect, perceptions about the personalities of women who choose to serve, and the difficulties of balancing military service and parenthood (10; 18; 21; 73; 92; 103; 118; 188). However, young, single women who choose to serve on active duty have also become single parents at a high rate, often leading to lower perceived social support for these mothers (14). Proposed incentives, such as unpaid leave of absence or career sabbaticals to care for young children, are often implausible for the single military mother, who is the sole source of income for her new family and often must seek financial assistance in addition to her military pay (14; 19; 21; 188). While single mothers frequently indicate that pregnancy and parenthood have no impact on their career plans, not all service members who give birth are retained on active duty (14).

During FY11, about 5% of female service members were lost to attrition prior to the end of their service obligation due to pregnancy, and 6% were discharged for "parenthood" reasons (92). Male service members do not receive a Chapter 8 (pregnancy) discharge, though a comparable loss rate for parenthood among male service members is about 1% (92). Additionally, these numbers do not include those service women who complete their service obligation and choose not to remain in service because they want to have children. Women leave the military service at disproportionately high rates across all ranks except among warrant officers, though the highest attrition rates are among junior enlisted women (20%) and junior-grade officers (24%), suggesting women are only completing one term of service (92). In a RAND study evaluating the difference

between officer promotion rates of women and minorities as compared to Caucasian males, women across all ethnic categories were significantly less likely than Caucasian male officers to reach O4 – a milestone that also typically signifies a career extending beyond the original service obligation (10). It is unclear precisely why women disproportionately choose to leave military service at a higher rate than their male counterparts. However, combat exclusion policies, differing promotion rates, and preference to raise a family without the work-family conflict of military service have all been suggested (10; 35; 92).

It is hard to determine whether work-family conflict or traditional family values plays a larger role in the decision to separate from service, but it is important for the Army to try and retain as many of its qualified female service members as possible. Retaining female service members leads to increasing the number of female leaders and mentors, and increased females in higher ranks. One way to do this is to ensure adequate leader support, career advancement opportunities, and supportive environments to raise a family in the military. This study aimed to evaluate leader attitudes toward military pregnancy and female Soldier integration. In that context, the study also aimed to identify leaders' familiarity with supportive programs and policies benefitting pregnant service members, particularly those programs which facilitate postpartum retention of women postpartum.

General Views of Pregnancy, Career Progression, and Women Serving in the Military

Although women have been serving on active duty (covertly or openly) for as long as the U.S. military has been in existence, women have only recently begun to serve in all available occupations within the military (13). Some service branches have more

open occupations for women than others – the Air Force had 99% of all jobs open to women as of FY 2011, while the Army (with the lowest density of open occupations) had only 66% of its jobs open to women (10; 92). With the exception of allowing female Naval officers to serve on submarines in 2012, the last time a major change to policies governing the assignment of women to military jobs occurred was about twenty years ago. At that time, the RAND Corporation assessed the potential impact of female integration into jobs formerly only available to men (86). The RAND study's data on perceptions of female integration into male units revealed a distinct gender bias with regard to the prospect of lifting the Combat Exclusion Rule. Specifically, the authors noted that while 80% of females surveyed supported a change in the policy that existed at the time of data collection, two-thirds of the male Officers surveyed supported no change to the policy (86). Furthermore, males of all ranks in both the Army and the Marine Corps were more likely to prefer the policy existing at the time of data collection over any change in policy that would allow more women into previously male-only jobs (86).

A few years later, a 2002 RAND study was conducted to determine how women were integrating into ten occupations formerly closed to them. Findings were mixed with regard to successful integration (i.e., some occupations had overrepresentation of women and total number of women were increasing, while in other occupations women were underrepresented and total numbers were decreasing), and that these difficulties were unrelated to the nature of the work or how well women did in training (84). The authors suggested policy changes that reduced the assumptions made about the types of career choices women would make, and encouraged career counselors to help women find careers that included career advancement within the occupation selected. Thus, despite

policy changes that opened doors for military women, cultural and attitudinal factors continued to influence their success in formerly closed jobs.

More recently, it has been found that general approval for women attaining expanding roles in military service varies by sex as well as by groups with varying degrees of military affiliation. Specifically, in a study of the approval for females serving in a variety of military jobs among male and female students at West Point, college ROTC students, and non-military affiliated college students, the authors found significantly higher approval among female students as compared to males (122). Further, the level of approval decreased by group from civilian students (who held the highest approval for women serving in a variety of military jobs), to West Point Cadets (who held the lowest approval). This finding suggests a strong influence within military culture that potentially impacts female service members as they progress in their careers.

In general, working mothers perceive their professional lives as part of their identity (106; 114). However, there is a very clear conflict in being able to be successful as a parent while simultaneously being successful at a career. An early study from 1996 suggested that, for career women Army Officers to be successful, they frequently choose not to marry or have children because of the difficulties of balancing work-family commitments (188). Specifically, the authors found that career women at the battalion command level were far less likely to be married than their male counterparts (56% of the women, as compared to 94% of the men), and only 20% of these women had children, as compared to over 98% of men at the same level of command (188). Additionally, they reported that no female general officers in the Army had ever had children and very few were married, strongly suggesting that to reach that high level of leadership, these women

chose not to marry or have children in exchange for their successful careers. As reflected in the data, this is a choice that male service members do not have to face.

These findings suggest that, despite male service members having no such limitation, female service members may feel that they must choose between career and family in order to attain successful careers. A study among mid-level (O3-O5) and senior (O6 and above) female officers in the U.S. Marine Corps (the branch of service with the lowest proportion of women) and the U.S. Air Force (the branch of service with the highest proportion of women) evaluated the presence of a "glass ceiling" in career progression (73). Like Westwood and Turner (1996), they also found that the proportion of single female officers had not changed significantly from 1982 to 2002, with female officers in both the Marine Corps and the Air Force more than twice as likely to be single than their male counterparts. Additionally, they found that the career trajectories of male and female officers were disproportionate with regard to the longevity of female leaders (73).

These findings are not dissimilar from those found in a 2012 RAND study exploring gender gaps in military career progression. Female service members are significantly less likely than Caucasian male service members to reach promotion and retention milestones (10). Unfortunately, we can only speculate as to the myriad reasons why this pattern persists, and it may not be exclusively due to child-bearing while serving. One study surveying Army Captains with regard to the impact of work climate influences on their decisions to leave the Army found that the psychological leadership climate held the largest influence over morale, affective commitment, and intentions to leave the Army (105). However, this study had 82% male participants and did not stratify

the results by gender. Another study evaluating predictors of retention, fitness, and efficacy found that perceptions that the military work environment was family-friendly were positively associated with intention to remain on active duty beyond the current service obligation (91).

While the findings of many of these studies prove inconclusive with regard to the reasons female service members disproportionately leave the service, the aggregate finding suggests a cultural shift may be necessary to retain trained and qualified female personnel. It appears that a more family-friendly work environment with high morale and supportive leadership would be of benefit to military mothers. However, the literature is limited in its analysis of work environments and the role of leadership among military women. Much of the military-relevant literature about pregnancy while serving on active duty was produced nearly twenty years ago. The Defense Women's Health Research Program (DWHRP) was a Congressionally-funded research program in FY94, dedicated to addressing potential health concerns impacting female service members (132). However, little new empirical evidence has been generated in these areas since that appropriation. Since the attacks on September 11, 2001, the research focus has shifted away from women's health issues, and the bulk of military-relevant literature has discussed Iraq and Afghanistan veterans' physical and mental health. In a PubMed search of all articles published since 2010 with "military" and "women" listed in any field, more than 1,200 "hits" were in topic areas ranging from disparate health care for military women, differing mental health needs of military women, military sexual trauma, posttraumatic stress disorder among military women, obesity among military women, and other factors. Of the 165 articles referencing pregnancy, most discussed lack of

contraception use, unplanned pregnancy, birth outcomes, postpartum depression prevalence, and lack of access to abortions among military women. However, pregnancy perceptions among service members and their superiors have received virtually no attention during this timeframe. A review of the civilian literature was similarly sparse with regard to recent work environment and work-family roles among female employees.

Analogous Research in Civilian Populations

Women in Law Enforcement

Given the limited literature in the military sector, understanding the roles of female law enforcement personnel may provide insight into some of the issues faced by female service members. Law enforcement is similar to the military, in that it is a predominantly male-gendered, uniformed job that is organized hierarchically and "quasi-militarily," and with approximately the same proportion of women employees as in the military (159). Like the military, the composition of police forces has changed over the last several decades to become more diverse with regard to race, gender, and sexual orientation (159). Sklansky (2006) notes that the research community has tended to overlook how these changes may impact the police force itself, instead focusing heavily on the demographics of those being policed and largely ignoring how the diversity of the force may impact the job.

As the workplace dynamics have shifted, research suggests that the transition of women and minorities into law enforcement has not been without its problems. Women police officers tend to experience more sexual harassment, gender discrimination, overt hostility (both within the workplace environment and out on patrol), and lack of sympathy or support from their male colleagues (76; 82; 88). Female officers also tend

not to adopt the hypermasculine features of their male colleagues or the police force culture in general, which impact both the way female officers engage in policing and the way male and female officers interact in the police force (141; 152).

There appears to be a divide among female law enforcement officers in balancing the demands of pursuing promotions at work and family requirements, as well. An interview-based study of police officers found career aspirations (specifically, a desire to pursue promotion) differed among female officers as compared to their male counterparts (3). Women had a reduced level of interest in pursuing promotion in their career over time, and one major factor associated with this decline was the increased importance of family responsibilities (3). This finding was particularly true among female police officers who were married to male police officers, or "dual cop" families, in which the upward mobility of the female officer was more likely to be restricted (3). With the number of dual military families accounting for 40% of female marriages in the Army, these findings may also translate to the military population and could account for some of the attrition and reduced promotion rates of female service members (4; 56; 105). When female police officers have children, their career trajectory is often impacted.

One female police officer, pregnant with her second child, requested light duty from her chief after having exhausted all of her personal leave and losing a year of seniority during her first pregnancy (101). The chief denied the request because he did not wish to set precedent, despite his subordinate being the only female officer on the force. This case highlights one of the factors impacting pregnancy in the civilian workplace – vulnerability issues among pregnant women supervised by non-pregnant (usually male) supervisors. Given the proportion of males to females in the military, the

policies that exist to ensure the adequate occupational health of pregnant service members may only be effective if leaders are familiar with these policies. This study also aimed to gauge leader familiarity with pregnancy policies.

Pregnancy Policy in Law Enforcement, School Districts, and the Public Sector

Pregnancy is a normal health condition that incurs temporary physical limitations. Despite the expansion of the Americans with Disabilities Act in 2008 to extend to temporary or short-term disability due to illness or injury, there is no specific inclusion of pregnancy limitations even with the evident similarities (30). The Family Medical Leave Act (FMLA) of 1993 includes accommodations for pregnancy, but are limited to 12 weeks without pay which, if exhausted prior to the end of pregnancy (as in the case of the police officer, above), means no postpartum recovery time or doing so at personal expense or the loss of one's job (30; 101). With such limited policies and laws in place to protect pregnant women in the workplace, many pregnant women in the civilian sector find that they are harassed, discriminated against, or are otherwise treated more poorly than their non-pregnant (or male) counterparts (95). Indeed, a frequent civil complaint brought against employers of pregnant women between 1990 and 2010 was discrimination (148).

These findings potentially translate to a military environment, which is male-dominated and potentially less family-focused than civilian sector jobs. In a 1996 study of pregnant military women, some 25% reported that they believed their pregnancy had a negative impact on their career progression, and 25% also reported that pregnancy negatively impacted their ability to make the military a career (70). Unfortunately, additional studies regarding women's perceptions of career impact during pregnancy

have not been conducted in the past two decades. However, the Defense Department Advisory Committee on Women in the Services (DACOWITS) focus groups have identified lack of time with family as a key reason female service members have left the military (33; 34).

Women in academia face similar challenges to military and law enforcement officers who elect to balance parenthood with career. In the "publish or perish" mentality of academics struggling to make tenure, women are less likely to take leave entitlements and often elect to return to work immediately postpartum (87). They are also less likely than their male counterparts to make tenure despite these efforts to minimize interruptions to their careers (87). Law enforcement and academia at the collegiate level are both male-gendered institutions. However, pregnancy policies in female-gendered institutions like public education were also found to be limited. A comparison of pregnancy policies in law enforcement and public education revealed that, despite a higher proportion of women in public schools, most school districts used FMLA only, and some required that dual-teacher families within the same district share the 12 weeks allotted (153). Other limitations included mandating that teachers take leave until the end of the semester at their own expense. While increased proportions of women in law enforcement appears to have a positive impact on maternity leave policies, women in public education are at a disadvantage because of the over-representation of women in public schools (153).

Pregnancy discrimination potentially impacts the career trajectory or retention of working women who become parents. Miller discusses the "postponement premium" incurred by employed women who delay parenthood, including a 10% career earnings

increase, 3% wage increase, and 5% increase in career work hours for each year of delay (133). Once women elect to have children, however, many workers face the unfortunate dilemma of choosing between her prenatal/postpartum health (and time to bond with her newborn) and her career. As a case example, a pregnant laboratory technician who was the most qualified in her position, ultimately chose to terminate her job after her supervisor refused to accommodate her changing work needs during her pregnancy and at the end of her maternity leave (109). The authors pointed out that the individual possessed "masculine qualities" such as assertiveness and a high level of competence that may have been threatening to her boss. Prior to this woman's departure from her job, she had also indicated she was unfairly evaluated on her work performance despite her high level of qualifications (109). The possibility of unfair performance evaluation is another potential concern for working mothers.

Perceived Competency and Performance Evaluation during Pregnancy

Mothers-to-be and lactating mothers in the workplace are often perceived as incompetent based on inferiority stereotypes associated with pregnancy and breastfeeding (121; 160). Additionally, pregnant women applying for work, particularly in more masculine or non-traditional jobs, tend to be treated with more hostility than non-pregnant women, while pregnant women engaged in more traditional roles (e.g., store customers) are treated in more overtly benevolent ways than their non-pregnant counterparts (89). Research on the implications of the superior-subordinate relational dyad are limited, though it is understood that this relationship will change during pregnancy of the employee (115). One potential change in this relationship is the

performance evaluation of the pregnant employee and the role of competence in performance evaluation.

A study of U.S. military supervisor-subordinate relationships among non-pregnant military women found that military women who presented themselves as competent (i.e., well-decorated service women with numerous accolades for excellence) were significantly more likely to be evaluated as lower performers than their female counterparts who presented themselves in a more traditional feminine manner (93). A study of Italian military male and female service members found that females entering a typically male-gendered job, such as military service, had affective qualities (e.g., lower cyclothymic features, higher hyperthymic features, and lower depressive and irritability traits) that were more similar to males (118). These findings suggest that military career women (who already may be serving in non-traditional gender roles) potentially face unfair evaluations because they are failing to uphold traditional gender norms. Indeed, in the context of a hypermasculine environment, where traditional masculine gender roles dominate, gender non-conforming women may experience higher levels of aggression in general than those who conform to traditional feminine gender roles (142). However, no studies have addressed military pregnancy and the impact on supervisor-subordinate relationships, or examined if similar dynamics in supervisor-subordinate relationships exist during pregnancy in the military. Because this study aimed to examine leaders' attitudes toward pregnancy and female integration into "male" occupations, it was important to also understand if leaders' attitudes are influenced by sexist views toward women and gender equality. Examining the attitudes and possible biases of leaders (who

potentially supervise pregnant Soldiers) is a first step toward examining supervisor-subordinate dyads in the Army.

Military operations have drawn down overseas, and women are now poised to enter formerly male-only jobs and are breaching the barriers to one day serve in elite groups such as the Army Rangers (104). Now is the time for the focus to shift back to women's health issues, including pregnancy, in the military workplace context. In general, health promotion among all service members remains a high priority in military culture. Health promotion for women includes maintaining health and fitness antepartum and postpartum, with special attention to meeting fitness standards at 180 days postpartum. Not only do these practices ensure force readiness, but they promote retention of women of childbearing age in the military.

MILITARY CULTURE AND HEALTH PROMOTION

Army health promotion as defined in the 2010 regulation on the subject is, "any combination of health education and related organizational, political, and economic interventions designed to facilitate behavioral and environmental changes conducive to the health and well-being of the Army community" (p. 1). Army health promotion uses programmatic interventions in the areas of health education, behavioral health, physical health, spiritual programs, and environmental and social programs to improve the overall fitness of its force (55). One area that routinely receives focus in Army health promotion is physical fitness.

Physical fitness in the military is considered part of the military culture, with each service branch having semi-annual or annual requirements to conduct fitness and body composition evaluations (47; 58; 60; 63; 66). The military infrastructure includes fitness

and physical health as key aspects of military professionalism. Indeed, fitness and physical health are so closely tied to military professionalism that failure to meet fitness and body composition standards can have an adverse impact on one's career.

To be considered for promotions, career advancement, professional development opportunities, military schools, awards, and other positive personnel actions, service members must be within height and weight standards and compliant with fitness requirements (48; 51; 54). Although beginning to have a downward trend, the two most common types of "flag" (identifying those who are barred from positive personnel actions as mentioned above) are for failure to meet fitness or height and weight standards by an overwhelming margin (78; 79). Service members who fail to meet these standards not only may miss out on these opportunities for professional growth, but multiple failures can lead to disciplinary actions and result in separation from service (49-51). With current guidance to reduce the total military force, it is not difficult to understand the personal, social, and occupational pressures involved in being compliant with these standards (164).

Fitness and health promotion during pregnancy

The cultural value of physical fitness as a part of military professionalism extends to pregnant and postpartum service members as well (44; 64; 65; 67). The American College of Obstetricians and Gynecologists released its Committee Opinion on antenatal exercise as a healthy option for uncomplicated pregnancies, and the Institute of Medicine recently updated its guidelines on appropriate weight gain during pregnancy (1; 94). Based on the guidance of these esteemed organizations, most service branches have encouraged pregnant service members to conduct exercise on an individual basis to

maintain fitness, reduce antepartum weight gain, and promote a healthy pregnancy (44; 64; 65; 67). The Army has taken additional steps to design a program that meets pregnant and postpartum service members' fitness and body composition needs (177).

HISTORY OF ARMY PREGNANCY AND POSTPARTUM PHYSICAL TRAINING (P3T)

In the late 1990s and early 2000s, the Army developed a fitness and education program for pregnant and postpartum active duty Soldiers. Pilot studies were conducted at Fort Benning, Fort Bragg, Fort Carson, and Fort Lewis to assess the effectiveness of the program in meeting fitness and body composition goals (77; 110; 150; 169). This mandatory program, the Army Pregnancy and Postpartum Physical Training (P3T) Program, was designed to assist pregnant Soldiers in their mission to limit excess antepartum weight gain, maintain fitness, and meet fitness and body composition requirements at 180 days (six months) postpartum (175).

A three-year study conducted prior to the initiation of P3T concluded that postpartum Army women were more likely to have higher incidents of illness and injury, fail postpartum fitness assessments, and have higher body fat percentage, among other poor health and fitness outcomes (178). Because the Army is the only service that offers a fitness program to its pregnant and postpartum service members, we looked to other services to compare how well women are able to achieve the fitness standards for their respective services on their own.

In a study of postpartum Air Force women attempting to meet the requirements of their fitness test six months postpartum, most women stated they found the prospect of training for their fitness tests to be extremely stressful (8). Further, these women, under the pressure of working to achieve pre-pregnancy fitness performance levels, also

experienced emotional distress and perceived lack of support from partners and colleagues. A study among Navy women found that those with a higher pre-pregnancy body mass index (BMI) and women who gave birth via cesarean section were significantly less likely to meet body composition standards six months postpartum (8; 26). Both studies concluded that improvements were needed in educating servicewomen on proper nutrition and exercise during pregnancy and postpartum to achieve optimal results and to reduce the burden on these women to achieve standards on their own (8; 26).

The Army appears to be meeting these demands with P3T, though it will soon be either eliminated or integrated with Army Physical Readiness Training (PRT) and included in the PRT mission (58). Thus, it is also important to know how well P3T is doing in meeting its stated goals of minimizing excess antepartum weight gain, maintaining antepartum fitness, providing education and support during pregnancy and postpartum, and improving fitness and body composition to meet standards by 180 days postpartum (177). It is difficult to ascertain what the impacts are of not having access to P3T for Army women because it is mandatory throughout the Army. However, it is possible to evaluate the program outcomes for women who participate in P3T at a variety of locations throughout the Army.

Previous evaluation of P3T

The Army Public Health Center (APHC) conducts annual evaluations of P3T by sending surveys to participants and local P3T leadership. While the APHC historically has had limited success in collecting data from the annual P3T evaluations, the overall findings suggest that well-implemented programs yield positive outcomes (174). A fiscal

year 2012 (FY12) survey of participants at Fort Campbell, Kentucky, one of the Army's most well-run P3T programs, found that participants valued the support of local leadership and the camaraderie of engaging in this program with their peers (125). While fewer than half reported meeting fitness and body composition standards, it is also unclear how many women are able to meet those standards without the benefit of P3T (125).

P3T has operated across the globe for more than a decade. However, as the Army moves to reduce the amount of personnel and spending in upcoming efforts to reduce the total force, P3T is potentially at risk for substantial changes in its operation or elimination altogether. P3T currently operates as a separate entity, but it may either be integrated into the current Army Physical Readiness Training (PRT) program as part of the Army's larger goal to maintain a fit fighting force, or P3T may be officially terminated. Continuing to provide a meaningful and beneficial way to maintain fitness during pregnancy and improve fitness and body composition postpartum for valuable Army professionals seems ideal. However, if termination of the program is considered the best option for the Army, it may speak to how leaders and other decision-makers value pregnancy in the military. That is, the burden would be placed back on the female Soldier to return to the fight if she chooses to also become a mother, rather than it being the goal of the command to assist Soldier-Moms in this process.

Despite evaluation by the APHC each year, one group has been largely omitted from the surveys of P3T stakeholders. Local commanders, who are responsible for providing P3T leadership personnel, funding the training of these leaders, and providing resources to P3T at their bases, have not been surveyed in these evaluations (175). It is

crucial to understand how P3T is perceived by commanders, who are ultimately responsible for its successful operation. Furthermore, it is important to understand commanders' attitudes toward military pregnancy because they may provide insight into how and why some locations tend to have greater difficulty with P3T implementation and operation. To that end, this study also aimed to examine whether a relationship exists between leaders' attitudes toward the implementation practices and the perceived operational success of P3T programs that these leaders control.

THE COMMANDER'S ROLE IN P3T

Commanders are responsible for providing personnel to serve in leadership positions in P3T implementation (170-172; 175). These positions are known as additional duties, jobs that are not part of the service members' occupational specialties but are "above and beyond" their daily tasks. Commanders assign leaders to operate P3T to fidelity, maintain accountability of their Soldiers, and conduct a safe and effective program to support these women in meeting their fitness and body composition goals (170-172; 175). Commanders are also responsible for completing their unit missions, daily tasks, preparing for large exercises and maneuver operations, preparing for deployments and redeployments, accounting for millions of dollars of equipment, and maintaining the fitness and well-being of the Soldiers and families assigned to their units (57).

Presumably, there is a great amount of tension between the demands on commanders and other Army leaders to have a fully trained, physically healthy force while also having a fully mission capable force that is deployable to worldwide mission operations. Many of the issues potentially impacting mission readiness are also impacted

by pregnancy. For example, commanders in support units with several female fuel-handlers may experience a devastating loss in mission readiness if these females were to become pregnant. Even if these Solders are reassigned to other duties within the same unit so that there is no loss of total personnel, the commander now lacks fuel-handlers, for example, who are essential to complete the mission. It is therefore important to ask leaders (including those in command roles) about how they perceive the impact of pregnancy on their units' mission readiness, OPTEMPO, morale, occupational safety concerns, and retention.

It is also important to address how leaders perceive the existing program that supports these pregnant service members in their efforts to maintain antepartum fitness and return to standards postpartum. Previous evaluations of P3T have not taken into account the potential burdens placed on local units to implement it, including manpower, funding, and resource allocation. Additionally, previous evaluations have not considered the value that local commanders may place on P3T with regard to training their Soldiers to be fit Soldier Moms.

Finally, despite previous evaluations by APHC of P3T implementation practices and outcomes, the assessment tools used in these evaluations have never been validated or assessed for reliability. Prior assessment questionnaires were developed in a public health assessment and program evaluation model to key in on specific Soldier outcomes and whether implementation was conducted with fidelity to program guidelines. To better understand leaders' attitudes toward pregnancy and integration, as well as their attitudes toward P3T implementation and goal attainment, it is important to ensure the measures being used are valid and reliable. Therefore, this study also aimed to develop an

assessment tool that adequately and consistently measures leaders' attitudes toward pregnancy, integration, and P3T.

Specific Aims and Research Questions

There are four aims to this study, each of which includes one to two research questions. The primary aim of this study was to assess the consistency of a measure, the Army Leader Pregnancy Attitudes (ALPA) questionnaire, to better understand how leaders' attitudes toward pregnancy in the military relate to perceived impacts on mission readiness and their obligation to maintain the fitness of their Soldiers. The secondary aim was to use the ALPA to identify and describe these attitudes, stratified by occupational specialty, as well as leaders' response to subordinate pregnancy, as indicated by policy recommendations, training needs, and attitudes about the work environment. The third aim of this study was to evaluate leaders' familiarity with and perceptions of the APHC administered P3T and recommendations for its implementation. These findings may have implications for not only how to support women within all occupational specialties, but also identify the resource and training needs of leaders who supervise women. The fourth aim was to examine leaders' reported preparedness for female integration as indicated by comfort with leading both male and female Soldiers and perceived adequacy of integration-related training.

Research questions for the four aims addressed in the study are as follows:

Aim 1. Develop and Test a Measure Evaluating Leader Attitudes Toward Pregnancy and Female Soldier Integration

The first aim was to develop and test the Army Leaders' Pregnancy Attitudes (ALPA) survey, a survey developed for this study to assess leaders' attitudes toward military pregnancy and P3T. This aim is comprised of two research questions:

Question 1a. Factors Related to Leaders' Attitudes:

Are there consistent factors related to leaders' attitudes toward pregnancy and female Soldier integration? These factors may include level of command support of pregnant Soldiers through policy adherence, use of current pregnancy programs, perceived adequacy of integration training, or level of agreement with pregnancy stigma. Additional factors may include perceived pregnancy impact on readiness, comfort with leading mixed-gender units, pregnancy planning/timing, and pregnancy compatibility with service.

Question 1b. Test-Retest Reliability of Survey:

Does the Army Leaders' Pregnancy Attitudes (ALPA) survey have adequate test-retest reliability? As a measure of consistency, it was essential to determine if responses would be replicated with a subsample of ALPA survey respondents after a span of two to four weeks after the initial survey was completed.

Aim 2. Leader Attitudes toward Pregnancy and Perceived Impact on Readiness

The second aim was to examine leaders' attitudes toward pregnancy in the military. This included general views of military pregnancy, pregnancy timing/planning, pregnancy compatibility with military service, and the impact of pregnancy on readiness. Attitudes were compared across the four major divisions of occupational specialties

(Operations, Operations Support, Force Sustainment, and Health Services Divisions). The mission and composition of these occupational specialties vary, which may or may not be associated with acceptance of women and of work reassignment due to pregnancy. Further, leaders from various occupational specialties may be less familiar with policies and programs addressing pregnancy.

Question 2a. Views of Pregnancy:

Do leaders' general views of pregnancy, including perceived impact on readiness, differ based on their occupational specialty? Leaders whose career fields are in Operations Division (lowest female integration) potentially have differing general views of military pregnancy than leaders in other occupations with higher female integration. However, sexist views and socially desirable responding (SDR) may also impact attitudes toward pregnancy. Therefore, sexism (as measured by the Impression Management Subscale [IMS] of the Marlow-Crowne Social Desirability Scale) and SDR (as measured by the Modern Sexism Scale [MSS]) were also included as variables.

Figure 2 depicts a broad conceptual model of the main variables and relationships tested. Some variables were observed or directly measured variables, while others were latent or indirect variables. For other analyses, the majority of these relationships are tested with few exceptions. To prevent redundancy in the text, the remaining conceptual models are depicted in Appendix F.

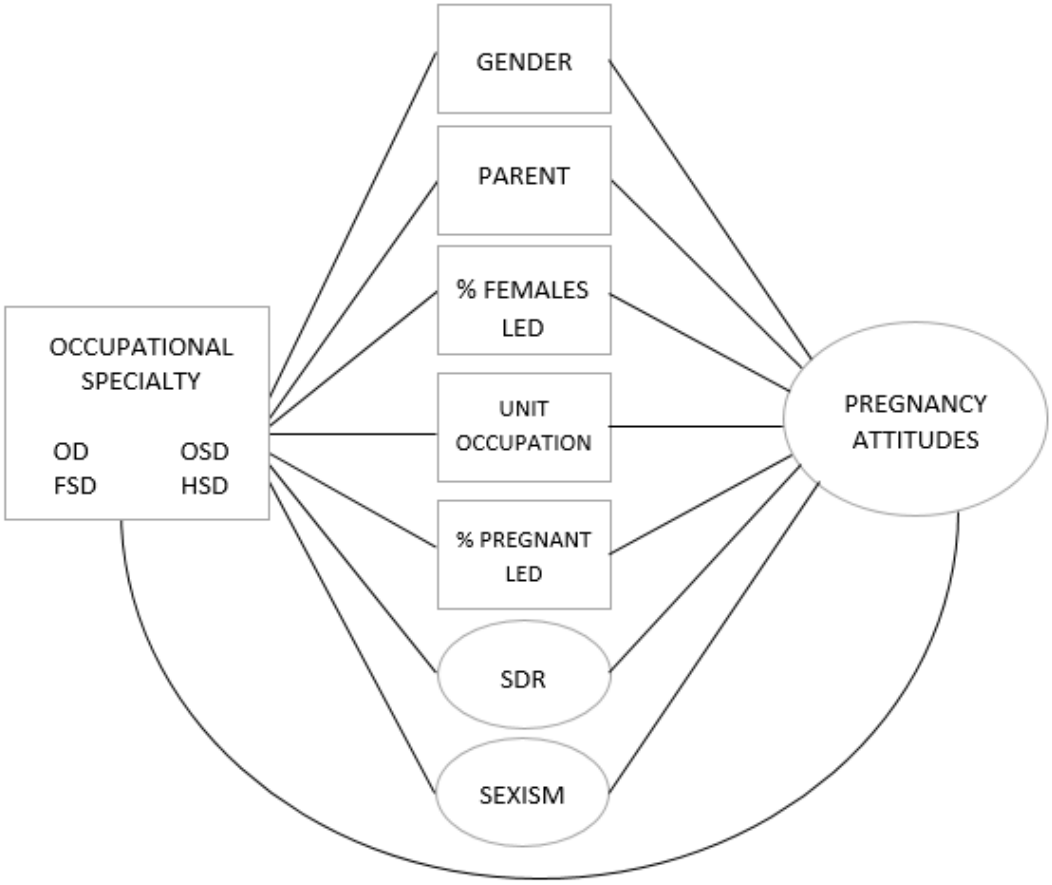

Figure 2. Conceptual Model of Aim 2, Question 2a, Pregnancy Attitudes. Conceptual model depicting the relationships tested in the research question, "Do leaders' general views of pregnancy, including perceived impact on readiness, differ based on their occupational specialty?" Observed variables include occupation, gender, parental status, percent female Soldiers led, percent pregnant Soldiers led, and main occupation of the unit assigned. Latent variables include socially desirable responding (SDR), sexism, and attitudes toward pregnancy.

Question 2b. Pregnancy Stigma and Impact on Readiness:

Do leaders have differing levels of agreement with pregnancy stigma and views on the impact of pregnancy to readiness by occupational specialty? Views may differ by occupational specialty, given that the greater proportion of pregnant Soldiers would be in units with greater proportions of women. Although pregnancy impacts readiness at only 1-4% of the total force at any given time, it is possible the greater proportion of female

service members in Health Services Division jobs would thus impact readiness at a higher rate. Sexist beliefs (as measured by the IMS) and SDR (as measured by the MSS) were included in the model.

Aim 3. Leaders' Familiarity with and Attitudes toward P3T

The third aim of this study was to describe leaders' familiarity with and attitudes toward the P3T program, stratified by occupational specialty. This included an assessment of proposed implementation strategies for P3T. Leader knowledge of P3T, leaders' perceptions of available resources to operate P3T, and leaders' perceptions of whether P3T is meeting its goals of maintaining antepartum fitness and helping postpartum Soldiers return to fitness and body composition standards were all assessed.

Question 3a. Familiarity with P3T:

Does leaders' knowledge of P3T differ based on their occupational specialty? Leaders in Operations Division (who have the lowest level of female integration) potentially have less knowledge about P3T than those in other career fields.

Question 3b. Attitudes Toward P3T Implementation and Outcomes:

Is there a relationship between leaders' attitudes toward P3T implementation practices and their views on P3T outcomes? Leaders who are at least minimally familiar with P3T may hold attitudes toward successful implementation of the P3T mission, which may be related to their attitudes about program outcomes.

Aim 4. Leaders' Perceived Readiness for Female Soldier Integration

The fourth aim of this study was to investigate leaders' perceived readiness to integrate female Soldiers into units formerly closed to women. This aim includes

examining leader attitudes toward adequacy of female Soldier integration training, stratified by occupational specialty.

Question 4. Female Soldier Integration Training Adequacy:

Do leaders' attitudes toward integration differ based on their occupational specialty? Are there occupational differences in leaders' perceived adequacy of the Army's training in preparing leaders to operate in mixed-gender units? Leaders in Operations Division (with lower female integration currently) are preparing to integrate at a rapid pace, whereas other occupations have historically been integrated more slowly.

CHAPTER 2: Methods

STUDY DESIGN

This is a descriptive study using cross-sectional survey methods to identify attitudes of leaders regarding pregnancy in the military, potential impacts to readiness, and knowledge of P3T. The study compared leaders from four occupational specialties (Operations, Operations Support, Force Sustainment, and Health Services). These comparisons were made to assess for possible group differences by occupation with regard to general pregnancy attitudes, pregnancy stigma and possible impacts to unit readiness, attitudes toward integration preparedness, and familiarity with available programs and resources targeting pregnant and postpartum Soldiers.

The predictor was the occupational specialty division of leaders, a four level factor (Operations, Operations Support, Force Sustainment, and Health Services). The comparison variables were specific views on pregnancy in the military, perceptions of supportive programs, level of knowledge about P3T, and beliefs about pregnancy policy for service members in operational units. Additional variables included leaders' gender, percent of female Soldiers led, percent of pregnant/postpartum Soldiers led, and parental status. Sexism and socially desirable response (SDR) bias were assessed using measures of sexist beliefs and social desirability.

INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL

This study was reviewed and approved by the Uniformed Services University Institutional Review Board (IRB). Consent process included participants reading an online informed consent document, which included the process of protecting information and opting out process. This document is included in Appendix D. A separate,

abbreviated informed consent process was conducted for individuals who elected to conduct a follow-up survey. The follow-up informed consent document is available in Appendix E.

The IRB waived the requirement to obtained signed informed consent documents from all participants. It also waived the requirement to meet the standards of the Health Information Portability and Accountability Act (HIPAA) because the questionnaires were conducted online, voluntarily, and did not include protected health information (PHI). It was considered non-human-subjects research by the IRB on this basis as well.

PARTICIPANTS

Through word-of-mouth and snowball sampling techniques, 657 Army leaders in active, National Guard, and Reserve components were recruited to participate in this study to assess leaders' perceptions on pregnancy in the Army and female Soldier integration into formerly closed units.

A Priori Sample Estimates

Prior to recruitment, estimation of sample size was conducted based on the proportion of service members in each occupational specialty. The minimum sample size for aims two and three, which is based on a medium effect size ($F = .25$) with at least .80 power and alpha level of .05, was 270. With 270 respondents, this would require 67.5 individual respondents per occupational specialty division. Health Services has the smallest proportion of Army personnel, at an estimated 8% of total force. Thus, to detect a medium effect size, at least 68 Health Services Division respondents were needed. Assuming the proportion of respondents would roughly match the proportion of individuals in the four occupational specialty divisions, the sample size was anticipated to

be at least 850 to detect a medium effect size with at least .80 power and alpha level of .05. A medium effect size was selected based on the ability to detect differences between occupational specialty groups, with small effect sizes = .10 and large effect sizes = .40. The total number of responses did not meet this expected sample size. However, data collected did not match expected proportions based on occupational specialty demographics. Nevertheless, sufficient responses were obtained to be able to run the analyses because at least 68 responses were obtained in the smallest occupation group (Health Services Division, $n = 68$). All a priori and post hoc power analyses were conducted using G*Power, a software program designed for this purpose (74).

Recruitment

Nonprobability convenience (e.g., availability of Internet access, frequenting of select social networking websites, accessing locations where flyers were physically posted) and using a snowball technique (e.g., word-of-mouth from other participants, sharing of web link from other participants) sampling methods were employed for this study. Introduction to the study and distribution of flyers and text-only advertisements containing the web-link to the survey was crowd sourced via social media pages, including online groups for military members. These recruitment methods were used to maximize the number of qualified respondents to assess leaders' perceptions on pregnancy in the Army and female Soldier integration into formerly closed units.

Inclusion and Exclusion Criteria

Participants in this study were Army officers and enlisted Soldiers age 18 or older who were currently serving (or who had left the service within the past year). Eligible participants included Army Soldiers on active duty, Army Reservists, and Army National

Guard members. Participants who served in leadership positions across multiple Army occupational specialties were preferred, but not required. Individuals who indicated they were not at least 18 years of age (n = 2) or not actively serving in one of the three listed components of the Army within the past year (n = 45) were excluded from analysis. Individuals who reported that they had not served in any kind of leadership position were initially planned to be excluded from analysis and some individuals were excluded on this basis (n = 9). However, this criterion exclusion was later revised so that non-leaders could be included.

MEASURES

Participants completed three self-report measures addressing leaders' attitudes toward pregnancy and P3T, socially desirable responding, and subtle sexist beliefs. The Army Leaders' Pregnancy Attitudes (ALPA) questionnaire was used to assess pregnancy, integration, and P3T attitudes. The Impression Management Subscale of the Marlow-Crowne Social Desirability Scale was used to address socially desirable responding (31; 182). The Modern Sexism Scale assessed subtle sexist beliefs (162).These measures will be discussed further in the following sections and are provided in Appendices A-C.

The Army Leaders' Pregnancy Attitudes (ALPA) Survey

The Army Leaders' Pregnancy Attitudes (ALPA) survey is a 64-item survey, which takes approximately 25 minutes to complete. It expanded upon a previous version, which was developed in collaboration with the Army Public Health Center (APHC) to evaluate P3T (See Appendix A). No validity data for the APHC's original version are available, as it was designed for public health assessment and program evaluation purposes and not established in a research design. The revision includes three sections

addressing leaders' attitudes toward military pregnancy, the Army's female integration policy, and the P3T program. These revisions will be addressed in subsequent sections. Additionally, data on demographics, occupation, parental status, percent of female personnel in the unit, and percent of pregnant/postpartum personnel in the unit are collected. The ALPA is composed of 14 forced-choice, five numerical data entry, two open-ended, and 43 visual analog scale items The visual analog scale items use a sliding bar and have a range of 0 (to indicate strong disagreement) and 100 (to indicate strong agreement) with various statements. There are also comment boxes after three series of items to allow respondents to contribute additional information.

Leader's Attitudes: Pregnancy Perspectives and Command Response to Pregnancy.

Twenty-two items on the ALPA are used to assess beliefs of leaders regarding commander support of pregnancy, pregnancy planning, and pregnancy compatibility with military service (items 43-64 in Appendix A). Items are assessed on a visual analog scale, ranging from "Strongly Disagree" (set at 0) to "Strongly Agree" (set at 100). One item, for example, is *Pregnancy would adversely impact my unit readiness more than other similarly time-limited non-deployable conditions*. Seven items in this section are reverse-scored, and higher scores indicate more negative views of pregnancy. Previous work from Evans and Rosen (1996, 1997) formed the basis for these 22 items (70; 72).

P3T Program Familiarity and Implementation Perspectives.

Twelve items on the ALPA assess P3T policies and implementation practices and are based on the Army Public Health Center's (APHC) historical program evaluation of P3T (174). These items are referred to as the P3T Subscale (P3TS) from this point forward, and are items 17-28 in Appendix A. Familiarity with P3T is evaluated using one

5-point Likert scale, anchored by (1) *I have never heard of P3T*, to (5) *I am very familiar with P3T and its requirements*. Higher scores on this item indicate more familiarity with P3T. Leaders' views regarding P3T operations are evaluated using nine items that are continuous and based on a sliding scale, ranging from "Strongly Disagree" (set at 0) to "Strongly Agree" (set at 100). Higher scores on these nine items indicate more favorable views of P3T operations. One item (#28) addresses leaders' recommended implementation strategy and leadership instruction for P3T. This item describes whether Army leaders indicate preference for a more individual-led P3T or a more central, leader-based P3T format. Space is available for leaders to input additional comments.

Policy, Training, and Female Integration Preparedness

Twelve items address policy, training, and general preparedness for female service member integration into formerly male units. These items address leaders' current level of comfort with female integration, leadership of female service members, and concerns about training and policy knowledge to support integration. These items are continuous and based on a visual analog scale, ranging from "Strongly Disagree" (set at 0) to "Strongly Agree" (set at 100). One item, for example, is *Women who intend to become pregnant within the deployment cycle should not be assigned to deploying/combat units*. Four items are reverse-scored, with higher scores indicating a higher level of concern (or possibly a more negative view) toward female integration readiness and associated policies. Two additional items are open-ended. One prompts leaders to describe what they see as potential barriers impacting female integration into all-male units. The second asks for proposed solutions or mitigation strategies to those barriers. These two items will be addressed descriptively in the results.

Impression Management Social Desirability Subscale (IMS)

To control for socially desirable response (SDR) bias, the Impression Management Subscale (IMS), comprises eight items from the Marlowe-Crowne Social Desirability Scale were included in the survey (31). This subscale has been found to have adequate reliability (Cronbach's $\alpha = .65$), with little difference noted based on age or sex (182). Items are dichotomous (True or False), with four items reverse scored. This measure takes less than five minutes to complete. See Appendix B for the full measure.

Modern Sexism Scale (MSS)

To control for the influence of sexist beliefs impacting how leaders view women's societal standing, participants completed the Modern Sexism (MSS) Scale (162). The scale has demonstrated satisfactory internal reliability, $\alpha = .75\text{-}84$ in two studies (Ibid). The eight items on the MSS were designed to measure denial of continuing sexism, antagonism toward women's demands, and resentment about special favors for women (Ibid). The original study used a five-point Likert-type scale to assess modern sexist beliefs. For this study, however, items are dichotomous (True or False), with three items reverse scored. The Cronbach's alpha for the binary responses was satisfactory ($\alpha = .78$). This measure takes less than five minutes to complete. See Appendix C for the full measure.

PROCEDURE

This study was conducted in collaboration with APHC. Surveys were distributed online via web link using Survey Gizmo, a commercially-available survey software that is compliant with Department of Defense (DoD) guidelines for network security. Funding for this account was provided through the Graduate Education Office (GEO) at the

Uniformed Services University of the Health Sciences (USUHS). Nonprobability convenience (e.g., availability of Internet access, frequenting of select social networking websites, accessing locations where flyers were posted) and snowball sampling methods (e.g., word-of-mouth from other participants, sharing of web link from other participants) were employed for this study. The web link was posted to online message boards and social media pages frequently accessed by Army Soldiers. Electronic and paper flyers were distributed to social media page managers and posted in locations typically frequented by Army Soldiers. Individuals who elected to participate were asked to share the web link with colleagues, friends, and family members who may also be eligible to participate.

Individuals who clicked on the web link were presented with an online informed consent document that included potential risks and benefits of participation, and the purpose and intent of the survey (see Appendix D). Users who began the survey but decided to opt out beyond the initial consent page could withdraw by discontinuing and closing their web browsers. Upon completion of the survey, all participants were asked if they consent to retest in 2-4 weeks after submitting their initial responses. If they chose to participate in follow-up, participants were asked to provide an unofficial (i.e., non-government or military) email address and provided additional informed consent (Appendix E). When the minimum required retest surveys were completed, email addresses and requests for follow-up were no longer solicited. Participants for the follow-up were again asked to provide the same email address to facilitate matching responses on initial and follow-up surveys. The final data set assigned identification numbers to

matched responses, so that email addresses could be removed to limit possible breaches of confidentiality.

DATA ANALYTIC STRATEGY

Surveys were conducted online and were automatically collected and archived in the software platform. The survey responses were then exported from the internet-based software and imported into data analytic software. For the purpose of this study, SPSS version 22 was used for data analysis.

Multiple Comparisons

No corrections were made for multiple comparisons. The rationale is that this study is a descriptive study, exploring possible relationships between variables that have a reasonable probability of being related (e.g., sexism score and agreement with idea that pregnancy is detrimental to unit readiness). In the social sciences, significance testing customarily sets the alpha level to $p = .05$. When conducting multiple independent comparisons, there is increased likelihood of erroneous rejection of the null hypothesis (relationships are attributed to chance alone) when the null is true (147). However, corrections to adjust for this possibility cause a much more conservative interpretation of the data, which may lead to erroneous failures to reject the null by stating that no relationship between variables exists outside of chance alone (Ibid.). Because it was important to identify if any possible relationships existed between variables, correction for multiple comparisons would limit the ability of this study to detect such relationships.

Achieved Power

Post-hoc power analyses were conducted for the most conservative of tests used. For the overall PCA for the ALPA, post-hoc power analysis was conducted using the sample size of 287 (the total of cases included in the analysis) with alpha level set to .05, and using the 325 degrees of freedom reported by SPSS in the analyses. The conventional effect sizes for X^2 tests are .10 for small effect, .30 for medium effect, and .50 for large effect. Achieved power was .83 for detecting a large effect, though it was .26 for detecting a medium effect. Post-hoc power analysis for the regression model depicting leaders' attitudes toward pregnancy was conducted using the sample size of 207, with the 11 variables included in the model. Results indicated statistical power was .20 for detecting a small effect, whereas the power was .98 for detecting a medium to large effect size. Thus, there was sufficient power at the medium to large effect size level, but less than adequate statistical power at the small effect size level.

Variables

Occupational specialty division, the predictor variable in the model, is a categorical variable in which there are four possible groups: Operations, Operations Support, Force Sustainment, and Health Services. There are other variables of interest to this study, which were also entered into the model. These variables include participant demographics (e.g., race, gender), parental status, percent of female Soldiers and percent of pregnant Soldiers led, impression management, and sexist beliefs. The variables of primary focus in this study are specific views on pregnancy in the military and knowledge and perceptions of P3T. These variables are designed to be continuous, such that respondents were able to rate their level of agreement with statements in each

category using a visual analog scale. This scale used a sliding bar, which ranged from zero to 100.

Analytic Strategy for Aim 1. Develop and Test a Measure Evaluating Leader Attitudes Toward Pregnancy and Female Soldier Integration

For aim one of this study, principal components analysis (PCA) was conducted. The purpose of the PCA was to measure internal consistency and to reduce the number of variables by identifying combinations of related variables that explain most of the variance in the data. This was important because the data includes a large number of highly correlated variables that would lead to problems with multicollinearity if they were treated as individual variables in the regression models. It was anticipated that components would be related to leader support of pregnancy and female Soldier integration. Additionally, test-retest reliability was examined using a correlation analysis of a subsample. The analytic strategy used for each research question follows.

Analytic Strategy for Question 1a. Factors Related to Leaders' Attitudes Toward Pregnancy and Female Soldier Integration

Factors related to leaders' attitudes toward pregnant Soldiers and integrated assignment of female Soldiers into formerly all-male units were examined. Specific attitudes addressed in the Army Leaders' Pregnancy Attitudes (ALPA) survey included attitudes toward pregnancy's impact on readiness, pregnancy planning/timing, pregnancy compatibility with service, leader readiness for female Soldier integration, and policy considerations for integration.

A principle components analysis (PCA) was conducted on the 34 ALPA items with oblique rotation. The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy (.78), and Bartlett's test of sphericity (X^2 (325) = 2102.99, $p < .001$) indicated

the between-item correlations were sufficiently large to conduct PCA. To determine the smallest number of components that would adequately explain the variance in the data, scree plots were used. The nine items on the P3T Subscale (P3TS) were found to be unrelated to the questions regarding general pregnancy attitudes. Thus, attitudes toward P3T were explored separately using the P3TS, and this subscale was not included in the analyses regarding pregnancy and integration attitudes. The resulting data from the P3TS were also found to be suitable for PCA using Bartlett's test of sphericity (X^2 (28) = 1582.73, $p < .001$) and KMO measure of sampling adequacy (.83).

Analytic Strategy for Question 1b. Test-Retest Reliability

To evaluate the temporal stability of the ALPA, a correlation analysis was used to obtain a test-retest reliability coefficient. Generally, a test-retest reliability coefficient of 0.7 or higher is considered acceptable. Test-retest reliability was assessed for the ALPA excluding P3T items, and the P3T Subscale separately.

Aim 2. Leader Attitudes toward Pregnancy and Perceived Impact on Readiness

For aim two of this study, multiple regression was used to identify and describe differences between the four occupational specialty divisions. Occupational specialty divisions were dummy coded into three variables with the Operations Division as the reference category. Comparisons were made on attitudes toward pregnancy and perceived impact of pregnancy on readiness (as estimated by factor scores). Comparisons were also made with the individual survey item assessing leader agreement with the statement that pregnancy adversely impacts readiness more than other medical conditions (item 43). Other variables that were included in this analysis included leader's gender, leader's parental status, percentage of females in the unit, and percentage of

pregnant/postpartum females in the unit. Categorical variables were dummy coded. The analytic strategy used for research questions under the second aim follow.

Analytic Strategy for Question 2a. Views of Pregnancy

To identify and describe leaders' attitudes toward pregnancy by occupational specialty division, a multiple regression was used. Leaders from the Operations Division generally have less experience with military pregnancy because Operations Division has the lowest female integration. Thus, it is possible their attitudes toward military pregnancy would differ from the attitudes of leaders in other occupations. Pregnancy attitudes were assessed based on the ALPA survey, querying leaders' attitudes toward pregnancy compatibility with service, pregnancy planning and timing, and pregnancy impacts to readiness. The variable of interest was the sum of the eight factor scores of the ALPA measure. Other variables in the model included occupational specialty, sexism as measured by the Modern Sexism Scale (MSS), estimated percentage of women in the unit, leader's gender, and leader's parental status. Socially desirable responding (SDR) was measured by the Impression Management Subscale (IMS) of the Marlowe-Crowne Social Desirability Scale (MC-SDS).

Analytic Strategy for Question 2b. Pregnancy Stigma and Impact on Readiness

A multiple regression was used to examine differences among occupational specialty divisions on leaders' attitudes toward pregnancy stigma and pregnancy-related readiness impact. Attitudes were compared by occupational specialty to assess for possible group differences. The variable of interest was the factor score assessing attitudes toward pregnancy stigma, which included survey items about perceived impact of pregnancy on unit readiness. The individual item assessing leaders' agreement with the

statement that pregnancy would adversely impact readiness more than other medical issues (item 43) was also analyzed in a separate regression model. Other variables included in these regression models include percent of women within the unit, percent of pregnant women within the unit, leaders' gender, leader's parental status, SDR, and sexism.

Analytic Strategy for Aim 3. Leaders' Familiarity with and Attitudes Toward P3T

Logistic regression was used to describe differences among occupational specialty divisions on knowledge about the P3T program. Occupational divisions were dummy coded with Operations Division as the reference category. Knowledge about P3T, a five-level categorical variable, was dummy coded based on P3T familiarity with "Very Familiar" used as the reference category. Similarly, other variables as noted above were included in this analysis. Multivariate multiple regression was used to identify and describe the relationship among leaders' attitudes toward P3T goal attainment, reach, implementation (as estimated by the sum of factor scores for the P3TS) and P3T familiarity level. The analytic strategy used for each of the hypotheses of the third aim follow.

Analytic Strategy for Question 3a. Familiarity with P3T

Logistic regression was used to determine whether P3T knowledge levels varied by occupational specialty. Leaders in Operations Division may have less knowledge about P3T than those in other career fields due to lower concentration of female Soldiers, who could become pregnant. The variable of interest was a five-level categorical variable assessing P3T familiarity. Other variables in the model include occupational specialty,

percent of women within the unit, percent of pregnant/postpartum women within the unit, leader's gender, and leader's parental status. Categorical variables were dummy coded.

Analytic Strategy for Question 3b. Attitudes Toward P3T Implementation and Outcomes

To identify a possible relationship between leaders' attitudes toward P3T implementation practices and their views on P3T outcomes, multivariate multiple regression was used. It is possible that leaders who perceive P3T to have adequate reach and sufficient implementation also have more favorable views of P3T successful outcomes. The variable of interest is the P3T factor score addressing leaders' attitudes toward P3T outcome success. Other variables in the model include P3T factor score addressing leaders' attitudes toward P3T implementation and reach, leader's parental status and gender, percentage of women in the unit, percentage of pregnant/postpartum women in the unit, subtle sexism, and SDR. Only leaders who indicated they were at least minimally familiar with P3T were asked to evaluate P3T implementation strategies and resources.

Analytic Strategy for Aim 4. Leaders' Perceived Readiness for Female Soldier Integration

To address the fourth aim, multiple regression was used to investigate whether occupational specialty divisions were related to leaders' perceived readiness for female Soldier integration. Readiness to integrate was approximated by the ALPA factor score assessing integration training adequacy. Additional analyses were conducted using the single item regarding comfort leading both male and female Soldiers (item 36). Occupational divisions were dummy coded with Operations Division as the reference

category. Similarly, other variables as noted above were included in this analysis. The analytic strategy used for the fourth aim follows.

Analytic Strategy for Question 4. Female Soldier Integration Training Adequacy

Multiple regression was used to determine whether perceived integration training adequacy was associated with occupational specialty. Lower perceived training adequacy was used as a proxy for lower readiness to integrate. The variable of interest was the ALPA factor score for attitudes regarding the adequacy of female Soldier integration training. Other variables in the model include occupational specialty, percent of women within the unit, percent of pregnant/postpartum women within the unit, leader's gender, and leader's parental status. The individual item assessing leaders' agreement with the statement that they are comfortable leading both male and female Soldiers (item 36) was also analyzed in a separate regression model and included as supplemental information. Refer to Appendix F for the conceptual models for these analyses.

CHAPTER 3: Results

DEMOGRAPHIC DATA

Six hundred fifty-seven Army leaders were recruited to participate in this study. With an available population of 561,730 personnel in the ranks and components included, the recruited sample was approximately 0.1% of the population (37; 38). Population demographics are displayed in Table S1 in Appendix F. Of the 657 recruited, three declined to participate after informed consent, two entered an age less than 18, and 45 did not meet duty status criteria (either current service or service within the past year in the active Army, National Guard, or Reserves). Respondents who discontinued the survey prior to completing at least 80% of the critical items on the ALPA (n = 153) were treated as opting out and excluded from analysis. An additional nine respondents were excluded based on lack of leadership status prior to expanding inclusion criteria to include individuals in non-leadership positions. Additionally, six respondents were excluded because they did not indicate their occupational specialty for themselves or their units, and another 16 were excluded for completing fewer than 60% of the critical survey items, resulting in a final sample size of 423. Figure S7 in Appendix F depicts a flow diagram of participants.

Demographic data are depicted in Table 1 by occupational specialty. Occupational specialties include Operations Division (OD), Operations Support Division (OSD), Force Sustainment Division (FSD), and Health Services Division (HSD). Eight individuals reported their unit occupation but not their own. For the purpose of analysis, these individuals were assumed to have an occupation in the same category as their assigned unit. A small number of individuals indicated they were not members of any of these occupational specialty divisions and were thus categorized as “Other.” The mean

age of respondents was 36.0 (*SD* = 7.2) years, with an average time in military service of 12.8 (*SD* = 6.8) years. Respondents were more likely to be female (65.0%), White (72.3%), non-Hispanic (90.5%), and were more likely to have been a parent while serving (75.7%). The respondents thus were not proportional to the demographics in the Army, which are predominantly male, Caucasian, non-Hispanic, and enlisted, per the Army G1 statistics from Fiscal Year 2011 (56).

Table 1. Categorical demographic data stratified by individual occupational specialty

Demographic	**OD (*n* = 92)**	**OSD (*n* = 92)**	**FSD (*n* = 158)**	**HSD (*n* = 68)**	**Other (*n* = 13)**	**Total (*n* = 423)**
GENDER						
Male	53 (57.6%)	28 (30.4%)	39 (24.7%)	22 (32.4%)	5 (38.5%)	147 (34.8%)
Female	39 (42.4%)	64 (69.6%)	119 (75.3%)	45 (66.2%)	8 (61.5%)	275 (65.0%)
LEADERSHIP						
Command	40 (43.5%)	25 (27.2%)	45 (28.5%)	24 (35.3%)	2 (15.4%)	136 (32.2%)
Other Leader	43 (46.7%)	57 (62.0%)	100 (63.3%)	38 (55.9%)	8 (61.5%)	246 (58.2%)
Non-leader	9 (9.8%)	10 (10.9%)	13 (8.2%)	6 (8.8%)	3 (23.1%)	41 (9.7%)
ETHNICITY						
Hispanic	5 (5.4%)	8 (8.7%)	16 (10.1%)	4 (5.9%)	1 (7.7%)	34 (8.0%)
Non-Hispanic	87 (94.6%)	83 (90.2%)	140 (88.6%)	62 (91.2%)	11 (84.6%)	383 (90.5%)
RACE						
Am Ind/AK Nat	1 (1.1%)	1 (1.1%)	2 (1.3%)	1 (1.5%)	0 (0.0%)	5 (1.2%)
Asian	0 (0.0%)	0 (0.0%)	4 (2.5%)	1 (1.5%)	0 (0.0%)	5 (1.2%)
Black/Af Amer	1 (1.1%)	9 (9.8%)	34 (21.5%)	4 (5.9%)	3 (23.1%)	51 (12.1%)
Nat HI/Pac. Isl.	0 (0.0%)	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	1 (0.2%)
White	85 (92.4%)	68 (73.9%)	92 (58.2%)	53 (77.9%)	8 (61.5%)	306 (72.3%)
2 or more races	4 (4.3%)	5 (5.4%)	11 (7.0%)	4 (5.9%)	2 (15.4%)	26 (6.1%)
Other	1 (1.1%)	8 (8.7%)	12 (7.6%)	5 (7.4%)	0 (0.0%)	26 (6.1%)
PARENTAL STATUS						
Parent	64 (69.6%)	68 (73.9%)	123 (77.8%)	53 (77.9%)	12 (92.3%)	320 (75.7%)
Non-parent	28 (30.4%)	23 (25.0%)	34 (21.5%)	15 (22.1%)	1 (7.7%)	101 (23.9%)
UNIT TYPE						
OD	71 (77.2%)	16 (17.4%)	29 (18.4%)	5 (7.4%)	1 (7.7%)	122 (28.8%)
OSD	3 (3.3%)	58 (63.0%)	9 (5.7%)	0 (0.0%)	1 (7.7%)	71 (16.8%)
FSD	2 (2.2%)	3 (3.3%)	84 (53.2%)	5 (7.4%)	2 (15.4%)	96 (22.7%)
HSD	0 (0.0%)	1 (1.1%)	4 (2.5%)	54 (79.4%)	1 (7.7%)	60 (14.2%)
Other	15 (16.3%)	14 (15.2%)	29 (18.4%)	3 (4.4%)	8 (61.5%)	69 (16.3%)
RANK						
Junior NCO	9 (9.8%)	35 (38.0%)	52 (32.9%)	15 (22.1%)	2 (15.4%)	113 (26.7%)
Senior NCO	9 (9.8%)	13 (14.1%)	12 (7.6%)	4 (5.9%)	2 (15.4%)	40 (10.0%)
Junior Officer	46 (50.0%)	22 (23.9%)	56 (35.4%)	27 (39.7%)	3 (23.1%)	154 (36.6%)
Senior Officer	28 (30.4%)	22 (23.9%)	38 (24.1%)	22 (32.4%)	6 (46.2%)	116 (27.4%)

Note: OD = Operations Division, OSD = Operations Support Division, FSD = Force Sustainment Division, HSD = Health Services Division, Other = respondents who indicated they are not members of the listed occupational specialty divisions; Percentages may not add up to 100% due to rounding or missing data.

MISSING DATA

A total of 270 cases had at least one variable imputed using a mean score replacement method. Imputation occurred on no more than 10 variables per case, with an average of six imputations per case, to avoid over-manipulation of data. The total imputed data accounted for approximately 7.0% of overall data. Table 2 represents the missing cases and imputation data. Of the 423 cases included in the analysis, 27% were complete, and the percent missing data for the rest of the cases ranged from 2% to 39% prior to imputation. The variables with the highest proportion of missing data on the ALPA were item 63, negative pregnancy remarks are harassment, and item 62, negative workplace pregnancy attitudes, with 32%. All other variables were missing an average of 10% (range 0% to 30%).

Table 2. Missing Data Management from Retained Cases (n = 423)

Status	*n*	%
Cases imputed, any variables	270	64%
Cases complete upon collection	114	27%
Cases lost to software issue (non-functional sliders, all scale items)	4	<1%
Cases missing data in 10-item set (non-functional sliders, 10 item series)	118	28%
Cases in which 10 variables imputed (max allowed)	68	16%
Cases missing 1-10% of data prior to imputation	86	20%
Cases missing 10-20% of data prior to imputation	132	31%
Cases missing >21% of data prior to imputation	84	20%

Note: Cases are included in multiple categories. Thus, totals do not add to sum of included cases or 100%.

Missing data occurred when participants skipped items, discontinued the survey after partially completing it, or due to technical problems with the survey software. For a period of approximately three days during data collection, the visual analog slider bars for most scale items were not available for selection by the survey software. Thus, respondents left these items blank. Four respondents during that three-day period were excluded from analyses as a result. During another discrete period of time, the visual

analog slider bars for one section of ten items appeared to malfunction, resulting in additional data loss for 118 cases, or about 30% of the data for these variables. One of these items was excluded from analyses due to poor fit. The remaining nine items were replaced with the mean value (50) for cases with no other missing data (n = 68) to prevent automatic omission by SPSS during analysis.

Replacement with mean scores was used as a way to manage missing data because case analysis indicated some items had more neutral mean scores (ranging from 41 to 59). For example, items that suggested limited knowledge base yielded more neutral responses (e.g., item 48, regarding unplanned pregnancy rates, which had a mean score of 53.72). Additionally, items potentially considered to be more controversial in nature were more likely to have more neutral mean scores, due to the bimodal distribution of responses at either end of the scale (e.g., item 30, regarding reassigning pregnant Soldiers out of deploying units rather than leaving them on rear detachment, which had a mean score of 49.84).

It was also discovered that, if a participant intended to score an item at 50, the slider bar still required activation (all sliders were set to 50 at the outset). If a participant desired to score a 50 and did not activate the slider by clicking on it during survey administration, the item was considered omitted by the survey software. Thus, replacement with mean was used for cases in which it was apparent the participant intended to score a 50. This method was applied only to participants who had consistently marked a variety of responses before and after the item(s) in question, and did not discontinue the survey. Thus, the strategy to address missing data through replacement with mean scores was considered less likely to adversely impact overall analyses.

FACTORS RELATED TO LEADERS' ATTITUDES TOWARD PREGNANCY AND FEMALE SOLDIER INTEGRATION (AIM 1A)

The first aim of this project was to develop and test a measure to evaluate leader attitudes toward pregnancy and female Soldier integration. To accomplish this, the author conducted principal components analysis (PCA) of the 34 scale items from the Army Leader Pregnancy Attitudes (ALPA) questionnaire and on the 9 scale items of the Pregnancy and Postpartum Physical Training Subscale (P3TS). Results of these analyses follow.

PCA for Army Leader Pregnancy Attitudes (ALPA)

Principal components analysis (PCA) of the ALPA was conducted , as items were assumed to be related and it was important to retain components that explain as much of the variance as possible. Of the total 423 cases, 287 contained sufficient data and were used in the analysis. As noted above, missing data were imputed using the replace with mean method on no more than 10 items per respondent. SPSS 22 automatically excludes cases with missing variables. The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis, KMO = .78 ("good" according to Field, 2009), and all but seven KMO values for individual items were above the acceptable limit of .5 (75). Those seven items were excluded from the analysis but are included in Appendix A (items 31, 32, 40, 44, 45, 48, and 60). Bartlett's test of sphericity X^2 (325) = 2102.99, $p <$ .001, indicated that correlations between items were sufficiently large for PCA.

An initial analysis was conducted to obtain eigenvalues for each component in the data. The analysis resulted in an eight-factor solution explaining 62.70% of the variance. Table 3 shows the regression coefficients for each variable by factor loadings. The items that cluster on the same components suggest that component 1 represents attitudes toward

pregnancy stigma, component 2 attitudes toward protective pregnancy policies, component 3 attitudes toward adequacy of pregnancy-specific training, component 4 attitudes toward career planning and pregnancy, component 5 attitudes toward pregnancy work environment, component 6 attitudes toward adequacy of female integration training, component 7 attitudes toward active pregnancy prevention support, and component 8 attitudes toward pregnancy compatibility with duty assignment. Names were selected based on neutral appraisal of the main focus of the items contained within each component and were verified by one other judge.

Table 3. PCA pattern matrix results for the ALPA survey (n = 287)

	Rotated Factor Loadings							
Item	Fac1	Fac2	Fac3	Fac4	Fac5	Fac6	Fac7	Fac8
47. No intentional pregnancy to avoid APFT	**.82**	-.04	.03	-.08	-.08	.10	.01	-.02
46. No intentional pregnancy to avoid deployment	**.78**	.01	.05	-.08	.02	.06	.00	-.09
63. Negative pregnancy remarks are harassment	**.64**	.11	-.07	.09	.22	-.24	-.06	.12
43. Pregnancy has larger impact on unit readiness	**-.45**	-.06	.03	.10	.12	.08	-.05	.38
58. No career damage for pregnancy reassignment	**.44**	**.42**	-.18	.06	-.11	-.03	-.13	-.09
55. In-unit pregnancy reassignment/physical limit	-.09	**.77**	.05	.11	-.03	.04	.04	.12
56. In-unit pregnancy reassignment due to hazard	.02	**.73**	-.09	-.13	.09	-.10	-.07	.03
64. Honor pregnancy profiles as prescribed	.28	**.53**	.06	-.03	.12	-.20	.03	.07
34. Train Soldiers on pregnancy policies	-.06	.11	**-.84**	-.12	.08	-.02	-.01	-.07
35. Train Soldiers on Army parent expectations	-.02	.00	**-.76**	.09	.16	.02	.10	-.18
33. Train leader on pregnancy policies	.01	-.10	**-.72**	-.05	-.17	.01	.07	.29
53. Timing of pregnancy in military career	-.03	.10	.16	**.80**	.03	.01	-.01	-.07
54. Some military jobs conducive for pregnancy	-.11	-.14	-.11	**.68**	.10	-.02	.01	.29
59. Pregnancy discrimination by peers uncommon	-.16	.09	.09	-.11	**-.67**	.08	.11	.20
62. Negative workplace pregnancy attitudes	-.05	.19	-.12	-.01	**.63**	.17	.18	.09
61. Peers have resentment of pregnant Soldiers	-.36	.22	.11	-.02	**.57**	.15	.10	.02
37/38. Adequate gender-integrated leader prep	-.24	.14	-.04	-.15	.00	**-.74**	-.16	.03
36. Comfort leading male and female Soldiers	.19	.02	.01	-.02	.03	**-.71**	.02	.06
39. Confidence in Soldiers' completing mission	-.03	-.07	.03	.22	-.12	**-.70**	.18	-.17
49. Increase contraception availability	-.08	.06	.01	-.06	-.07	-.04	**.85**	-.06
50. Increase pregnancy prevention education	.14	-.09	-.16	.06	.05	.00	**.77**	.01
30. No rear-detachment pregnant women	.03	.14	.03	.07	-.11	.05	-.01	**.79**
29. Limit assignments for planned pregnancy	-.09	.09	-.12	.14	-.16	.04	-.06	**.77**
52. No kids for successful military career women	-.02	-.36	.08	-.20	.36	-.01	.10	**.53**
57. Externally reassign pregnant Soldiers	-.13	.17	.12	-.05	.13	.01	.29	**.52**
51. Pregnancy is compatible with military service	.22	.31	.00	.20	-.36	-.06	.00	**-.41**
Eigenvalues	5.01	2.61	2.24	1.55	1.38	1.29	1.15	1.08
% of Variance	19.27	10.03	8.60	5.94	5.32	4.98	4.43	4.15

Note: Factor loadings over .40 appear in bold; verbatim survey items are in Appendix A; Fac1 = Pregnancy Stigma, Fac2 = Pregnancy Policy, Fac3 = Training Adequacy, Fac4 = Career Planning, Fac5 = Work Environment, Fac6 = Integration Training, Fac7 = Pregnancy Prevention, Fac8 = Duty Compatibility.

Table 4 shows the correlation coefficients between each variable and component after rotation. The ALPA appeared to have less than adequate internal consistency, α = .69, with an average inter-item correlation of .08.

Table 4. Summary of PCA structure matrix results for the ALPA survey (n = 287)

	Rotated Factor Loadings							
Item	Fac1	Fac2	Fac3	Fac4	Fac5	Fac6	Fac7	Fac8
47. No intentional pregnancy to avoid APFT	**.80**	.06	-.06	-.11	-.15	-.09	-.10	-.29
46. No intentional pregnancy to avoid deployment	**.79**	.10	-.04	-.10	-.06	-.13	-.10	-.35
63. Negative pregnancy remarks are harassment	**.66**	.27	-.18	.08	.15	-.40	-.12	-.11
43. Pregnancy has larger impact on unit readiness	**-.62**	-.12	.09	.10	.20	.25	.09	**.55**
58. No career damage for pregnancy reassignment	**.59**	**.50**	-.23	.08	-.17	-.27	-.21	-.27
55. In-unit pregnancy reassignment/physical limit	.15	**.76**	-.12	-.10	.10	-.25	-.10	.03
56. In-unit pregnancy reassignment due to hazard	-.04	**.76**	.05	.14	.00	-.07	.03	.18
64. Honor pregnancy profiles as prescribed	.36	**.61**	-.02	-.01	.10	-.34	-.04	-.02
34. Train Soldiers on pregnancy policies	.09	.12	**-.84**	-.12	.15	-.09	.07	-.04
35. Train Soldiers on Army parent expectations	.11	.01	**-.78**	.09	.20	-.04	.18	-.13
33. Train leader on pregnancy policies	-.01	-.08	**-.72**	-.04	-.07	.03	.17	.28
53. Timing of pregnancy in military career	-.03	.12	.16	**.80**	-.04	-.05	-.02	-.06
54. Some military jobs conducive for pregnancy	-.24	-.11	-.10	**.67**	.11	.03	.10	.33
59. Pregnancy discrimination by peers uncommon	-.16	.15	-.17	-.05	**.69**	.20	.31	.24
62. Negative workplace pregnancy attitudes	-.45	.13	.11	-.05	**.62**	.25	.22	.26
61. Peers have resentment of pregnant Soldiers	-.20	.04	.15	-.07	**-.61**	.13	.06	.20
37/38. Adequate gender-integrated leader prep	.33	.19	-.06	.02	-.01	**-.74**	-.09	-.10
36. Comfort leading male and female Soldiers	-.03	.26	-.04	-.09	-.02	**-.72**	-.23	-.01
39. Confidence in Soldiers' completing mission	.16	.06	-.02	.28	-.17	**-.70**	.05	-.26
49. Increase contraception availability	-.14	.01	-.06	-.03	.04	.07	**.83**	.07
50. Increase pregnancy prevention education	.04	-.10	-.26	.07	.14	.08	**.78**	.07
30. No rear-detachment pregnant women	-.32	.10	-.10	.15	-.06	.13	.05	**.78**
29. Limit assignments for planned pregnancy	-.23	.16	.03	.08	-.02	.12	.07	**.78**
52. No kids for successful military career women	-.35	.14	.09	-.05	.25	.14	.38	**.63**
57. Externally reassign pregnant Soldiers	-.30	-.36	.05	-.24	.44	.20	.22	**.58**
51. Pregnancy is compatible with military service	.45	.35	-.01	.24	-.45	-.27	-.15	**-.53**

Note: Factor loadings over .50 appear in bold; verbatim survey items are in Appendix A; Fac1 = Pregnancy Stigma, Fac2 = Pregnancy Policy, Fac3 = Training Adequacy, Fac4 = Career Planning, Fac5 = Work Environment, Fac6 = Integration Training, Fac7 = Pregnancy Prevention, Fac8 = Duty Compatibility.

The component correlation matrix for the ALPA scale is displayed in Table S2 in Appendix F.

PCA for Pregnancy and Postpartum Physical Training (P3T) Subscale

PCA was also conducted on the 9 scale items of the Pregnancy and Postpartum Physical Training Subscale (P3TS), as items were assumed to be related. Only respondents who indicated at least minimal familiarity with P3T were asked to complete these items. Of the 423 original cases, 361 reported at least minimal familiarity with P3T. Of these, 324 contained sufficient data and were used in the analysis. For this analysis,

KMO = .83 (“great” according to Field, 2009), and all but one KMO value for individual items was above the acceptable limit of .5 (75). The item regarding attitudes toward P3T fitting with operational tempo (OPTEMPO) did not achieve a KMO value of .5 or greater and was thus excluded on this basis (item 21 in Appendix A). Bartlett’s test of sphericity (X^2 (28) = 1582.73, $p < .001$), indicated that correlations between items were sufficiently large for PCA. An initial analysis was conducted to obtain eigenvalues for each component in the data. The analysis resulted in a 2-factor solution explaining 73.19% of the variance. Table 5 shows the regression coefficients for each variable by factor loadings after rotation. The items that cluster on the same components suggest that component 1 represents attitudes toward P3T goal attainment, and component 2 represents attitudes toward P3T reach and implementation. As above, names were selected based on neutral appraisal of the main focus of the items contained within each component and were verified by one other judge.

Table 5. Summary of PCA pattern matrix results for the P3T Subscale (n = 324)

	Rotated Factor Loadings	
Item	Fac1	Fac2
25. P3T facilitates postpartum APFT success	**.94**	-.02
26. P3T facilitates postpartum height/weight success	**.93**	-.06
24. P3T maintains pregnancy fitness	**.92**	-.03
27. P3T is compatible with Army PRT	**.82**	.00
23. P3T provides safe fitness training	**.58**	.27
19. Cross-installation/multi-unit P3T reach	-.14	**.95**
20. Multi-unit P3T implementation	.02	**.83**
22. Command supports P3T	.21	**.69**
Eigenvalues	4.30	1.56
% of Variance	53.69	19.51

Note: Factor loadings over .50 appear in bold; verbatim survey items are in Appendix A; Fac1 = P3T Goals, Fac2 = P3T Reach.

Table 6 shows the correlation coefficients between each variable and component of the P3TS.

Table 6. Summary of PCA structure matrix results for the P3T Subscale (n = 324)

	Rotated Factor Loadings	
Item	Fac1	Fac2
25. P3T facilitates postpartum APFT success	**.93**	.33
26. P3T facilitates postpartum height/weight success	**.91**	.32
24. P3T maintains pregnancy fitness	**.90**	.29
27. P3T is compatible with Army PRT	**.82**	.30
23. P3T provides safe fitness training	**.68**	.48
19. Cross-installation/multi-unit P3T reach	.22	**.90**
20. Multi-unit P3T implementation	.34	**.84**
22. Command supports P3T	.47	**.77**

Note: Factor loadings over .50 appear in bold; verbatim survey items are in Appendix A; Fac1 = P3T Goals, Fac2 = P3T Reach.

The P3TS appeared to have good internal consistency, α = .87, with an average inter-item correlation of .45. The component correlation matrix for the P3TS is displayed in Table S3 in Appendix F.

TEST-RETEST RELIABILITY FOR THE P3TS AND ALPA (AIM 1B)

A total of 241 individuals agreed to participate in a follow-up survey. Two individuals supplied invalid email addresses, one was contacted within the timeline but did not complete the follow-up until 2 months later, one was omitted in the follow-up process, and 128 did not respond to initial or second contact requests. A total of 110 individuals completed or partially completed the follow-up survey (including the individual who completed the follow-up 2 months after contact). Insufficient initial or follow-up data that prevented adequate comparisons led to the exclusion of 22 cases, resulting in a final set of 88 respondents. Figure S7 in Appendix F displays the flow diagram of participant data.

Test-Retest for the ALPA

There was a significant relationship between 24 of the 26 items on the ALPA questionnaire at time one and at time two, with correlation coefficients ranging from r =

.29, p (one-tailed) < .01 to r = .79, p (one-tailed) < .001. The item regarding Soldier education about pregnancy (item 34) and the item regarding reassignment of pregnant women to prevent chemical exposure (item 56) did not produce significant relationships at time one and time two. There was, however, a significant relationship between the sum of ALPA factor scores at time one and at time two, r = .40, p (one-tailed) < .01. Results are displayed in supplemental Table S4 in Appendix F.

Test-Retest for the P3TS

There was a significant relationship between each of the P3TS items at time one and at time two, with correlation coefficients ranging from r = .53 to r = .71 (all ps [one-tailed] < .001). Additionally, there was a significant relationship between the sum of P3T factor scores at time one and at time two, r = .79, p (one-tailed) < .001. Table 6 shows correlations at time one and time two for each of the eight items included in the overall analysis. The data in Table 7 are truncated; only comparisons between time one and time two are displayed.

Table 7. P3T Subscale Correlation Coefficients at Time One and Time Two

Time One	Time Two							
	Reach	P3T Imp	Support	Safety	Fitness	APFT	Ht/Wt	PRT
Reach	.71***	.49***	.52***	.12	.17	.30**	.33**	.12
P3T Imp		.60***	.29*	.27*	.33**	.43***	.46***	.27*
Support			.71***	.48***	.54***	.60***	.58***	.39**
Safety				.67***	.46***	.48***	.50***	.50***
Fitness					.67***	.64***	.60***	.46***
APFT						.60***	.57***	.45***
Ht/Wt							.60***	.45***
PRT								.53***

Note: Reach = Soldiers using program across installation; P3T Imp = implementation by multiple leaders across installation; Support = command support of P3T; Safety = P3T is perceived as safe; Fitness = P3T achieves goal to maintain pregnancy fitness; APFT = P3T achieves goal to pass postpartum APFT; Ht/Wt = P3T achieves goal to pass postpartum body composition; PRT = P3T is compatible with Army PRT. * Correlation is significant at the p < .05 level (one-tailed), ** Correlation is significant at the p < .01 level (one-tailed), *** Correlation is significant at the p < .001 level (one-tailed).

LEADER ATTITUDES TOWARD PREGNANCY BY OCCUPATIONAL SPECIALTY (AIM 2A)

A multiple regression was conducted to assess the possible relationship between occupational specialty and leader attitudes toward pregnancy. Results are depicted in Table 8. A total of 207 cases contained sufficient data and were included in the analyses. The influence of the independent variables on attitudes toward pregnancy in the military was quite small. Regression analysis indicated that the model only accounted for 13.6% of the variance in the sample. Occupation was not significantly associated with attitudes toward pregnancy (as approximated by the sum of factor scores). However, other variables were related to attitudes toward pregnancy, including the Impression Management Subscale (IMS) indexing social desirability, the Modern Sexism Scale (MSS), and gender of the respondent.

Table 8. Leader Attitudes Toward Pregnancy by Occupation (n = 207)

	B	*SE B*	β
Constant	9.08	1.89	
OD to OSD	-0.83	0.73	-.14
OD to FSD	-0.77	0.67	-.14
Modern Sexism Scale (MSS)	-0.22	0.09	-.18*
Impression Management Subscale (IMS)	-0.42	0.12	-.24***
Parental Status	-0.29	0.41	-.05
Gender	-0.94	0.42	-.17*
Female Soldiers Led	0.01	0.01	.06
Pregnant Soldiers Led	0.00	0.01	.01
OD Units to OSD Units	-0.55	0.65	-.09
OD Units to FSD Units	0.21	0.56	.04
OD Units to HSD Units	-0.49	0.62	-.07

Note: OD = Operations Division; OSD = Operations Support Division; FSD = Force Sustainment Division; HSD = Health Services Division; R^2 = .14. * p < .05, ** p < .01, *** p < .001

LEADER ATTITUDES TOWARD PREGNANCY STIGMA AND IMPACT TO READINESS BY OCCUPATIONAL SPECIALTY (AIM 2B)

A multiple regression was conducted to assess whether occupational specialty related to leader attitudes toward pregnancy stigma and pregnancy impact to readiness. Results of the regression are displayed in Table 9. The model accounted for 32.4% of the

variance. Occupation was not significantly associated with attitudes toward pregnancy stigma (which includes attitudes about pregnancy's impact to readiness). Several other variables correlated with attitudes toward readiness impact, including SDR, sexism, and gender of the respondent.

Table 9. Leader Attitudes Toward Pregnancy Stigma by Occupation (n = 207)

	B	*SE B*	β
Constant	-0.98	0.63	
OD to OSD	0.04	0.24	.02
OD to FSD	0.03	0.22	.02
Modern Sexism Scale (MSS)	-0.13	0.03	-.27***
Impression Management Subscale (IMS)	0.11	0.04	.17**
Parental Status	0.06	0.14	.03
Gender	0.67	0.14	.32***
Female Soldiers Led	0.00	0.00	.02
Pregnant Soldiers Led	0.00	0.00	.02
OD Units to OSD Units	0.33	0.21	.14
OD Units to FSD Units	0.27	0.19	.12
OD Units to HSD Units	0.26	0.21	.10

Note: OD = Operations Division; OSD = Operations Support Division; FSD = Force Sustainment Division; HSD = Health Services Division; R^2 = .33. * p < .05, ** p < .01, *** p < .001

One item specifically addressed this concern, which loaded to the component of pregnancy stigma. Most respondents (n = 246, 57.3%) disagreed with the idea that pregnancy adversely impacted unit readiness more than other time-limited injuries or medical conditions (M = 36.9, SD = 35.2). However, 133 respondents to this item (31.0%) also endorsed some level of agreement with this item, as evidenced by a scale score greater than 50. When considering the one item of the survey that specifically addresses the question of unit readiness impact based on pregnancy, multiple regression analysis (n = 232) shows that 28.2% of the variance is accounted for in the model. Table 10 displays the findings from this analysis. Additionally, the comparison between units of assignment between Operations and Operations Support reaches statistical significance (p < .05). As for the component measuring pregnancy stigma, attitudes about pregnancy's

impact on unit readiness are associated with sexist beliefs and impression management. However, the strongest association appears to be with gender ($p < .001$).

Table 10. Leader Attitudes Toward Pregnancy Readiness Impact by Occupation ($n = 232$)

	B	*SE B*	β
Constant	85.58	21.67	
OD to OSD	-0.76	8.60	-.01
OD to FSD	-13.20	7.69	-.18
Modern Sexism Scale (MSS)	2.08	1.03	.13*
Impression Management Subscale (IMS)	-2.74	1.37	-.12*
Parental Status	-6.52	4.80	-.08
Gender	-26.80	4.84	-.37***
Female Soldiers Led	0.03	0.10	.02
Pregnant Soldiers Led	0.00	0.06	.00
OD Units to OSD Units	-17.80	7.64	-.20*
OD Units to FSD Units	-0.99	6.48	-.01
OD Units to HSD Units	-9.90	7.14	-.11

Note: OD = Operations Division; OSD = Operations Support Division; FSD = Force Sustainment Division; HSD = Health Services Division; $R^2 = .33$. * $p < .05$, ** $p < .01$, *** $p < .001$

LEADER FAMILIARITY WITH P3T BY OCCUPATIONAL SPECIALTY (AIM 3A)

Familiarity with P3T was based on response to item 17 on the P3TS. Familiarity level stratified by occupational specialty are displayed in Table 11.

Table 11. Leader Familiarity with P3T by Occupational Specialty ($n = 423$)

P3T Familiarity Level	**OD (*n* = 92)**	**OSD (*n* = 92)**	**FSD (*n* = 158)**	**HSD (*n* = 68)**	**Other (*n* = 13)**	**Total (*n* = 423)**
Never Heard	14 (15.2%)	8 (8.7%)	34 (21.5%)	4 (5.9%)	2 (15.4%)	62 (14.7%)
Heard of P3T	21 (22.8%)	15 (16.3%)	33 (20.9%)	15 (22.1%)	5 (38.5%)	89 (21.0%)
Somewhat	22 (23.1%)	25 (27.2%)	32 (20.3%)	13 (19.1%)	0 (0.0%)	92 (21.7%)
Moderate	14 (15.2%)	20 (21.7%)	21 (13.3%)	21 (30.9%)	2 (15.4%)	78 (18.4%)
Very	21 (22.8%)	24 (26.1%)	38 (24.1%)	15 (22.1%)	4 (30.8%)	102 (24.1%)

Note: OD = Operations Division, OSD = Operations Support Division, FSD = Force Sustainment Division, HSD = Health Services Division, Other = respondents who indicated they are not members of the listed occupational specialty divisions; Percentages may not add up to 100% due to rounding or missing data.

A multinomial logistic regression was conducted to examine the possible relationship between occupational specialty and leaders' familiarity with P3T. Results are displayed in Table 12. The model, which included 274 cases, was found to predict P3T

familiarity significantly better than intercept alone (X^2 (36) = 89.17, p < .001). The Pearson chi-square statistic indicated the model fit the data well (X^2 (1056) = 1087.33, p = .245). There was a main effect of gender (X^2 (4) = 15.35, p = .004), parental status (X^2 (4) = 16.19, p = .003), percent of female Soldiers led by the respondent (X^2 (4) = 11.92, p = .018), and occupational specialty of the respondent (X^2 (12) = 34.06, p = .001) on leaders' familiarity with P3T. Parameter estimates indicated the gender of the respondent was significantly associated with whether they would have no knowledge of P3T or be very familiar with P3T, b = 1.31, Wald X^2 (1) = 5.07, p = .024. Males were more than three-and-a-half times more likely than females to have never heard of P3T compared to being very familiar with the program. Parental status of the respondent was also significantly associated with whether they would have no knowledge of P3T or be very familiar with it, b = 1.31, Wald X^2 (1) = 4.46, p = .035. Individuals who were not parents were more than three-and-a-half times more likely than parents to have never heard of P3T compared to being very familiar with the program. Those who indicated their occupation was in the Other category were not included in this analysis due to small group size (n = 13).

Table 12. Leader Familiarity with P3T by Occupation and Covariates (n = 274)

		95% CI for Odds Ratio		
	B (SE)	Lower	Odds Ratio	Upper
Never Heard of P3T vs. Very Familiar				
Intercept	-1.22 (2.55)			
Gender	1.31 (0.58)*	1.19	3.72	11.66
Parental Status	1.31 (0.62)*	1.10	3.71	12.49
Operations Division occupation	0.15 (1.34)	.08	1.16	16.19
Operations Support occupation	0.74 (1.24)	.18	2.09	23.92
Force Sustainment occupation	2.25 (1.10)*	1.10	9.47	81.36
Health Services occupation	0	---	---	---
Percent Female Soldiers	0.01 (0.01)	.99	1.01	1.03
Percent Pregnant/Postpartum Soldiers	-0.01 (0.01)	.97	.99	1.01
Total Impression Management Score	-0.16 (0.15)	.64	.85	1.14
Total Subtle Sexism Score	0.02 (0.12)	.81	1.02	1.28
Heard of P3T vs. Very Familiar				
Intercept	0.57 (2.05)			
Gender	1.24 (0.49)*	1.31	3.46	9.10
Parental Status	1.82 (0.51)***	2.25	6.14	16.77
Operations Division occupation	-0.57 (0.70)	.14	.57	2.24
Operations Support occupation	-0.72 (0.69)	.13	.49	1.87
Force Sustainment occupation	0.05 (0.57)	.34	1.05	3.23
Health Services occupation	0	---	---	---
Percent Female Soldiers	-0.00 (0.01)	.98	1.00	1.02
Percent Pregnant/Postpartum Soldiers	-0.01 (0.01)	.97	.99	1.00
Total Impression Management Score	-0.11 (0.13)	.70	.90	1.15
Total Subtle Sexism Score	0.03 (0.10)	.85	1.03	1.25
Somewhat Familiar vs. Very Familiar				
Intercept	1.94 (1.93)			
Gender	1.67 (0.46)***	2.15	5.33	13.17
Parental Status	1.48 (0.50)**	1.64	4.41	11.83
Operations Division occupation	-0.86 (0.67)	.11	.42	1.58
Operations Support occupation	-0.04 (0.60)	.29	.96	3.13
Force Sustainment occupation	-0.11 (0.55)	.31	.90	2.63
Health Services occupation	0	---	---	---
Percent Female Soldiers	-0.01 (0.01)	.98	.99	1.01
Percent Pregnant/Postpartum Soldiers	-0.01 (0.01)	.98	.99	1.00
Total Impression Management Score	-0.12 (0.12)	.70	.89	1.13
Total Subtle Sexism Score	-0.07 (0.10)	.77	.93	1.12
Moderately Familiar vs. Very Familiar				
Intercept	1.89 (2.00)			
Gender	1.19 (0.48)*	1.28	3.27	8.37
Parental Status	1.00 (0.54)	.94	2.71	7.79
Operations Division occupation	-1.72 (0.67)*	.05	.18	.67
Operations Support occupation	-0.58 (0.56)	.19	.56	1.68
Force Sustainment occupation	-1.28 (0.53)*	.10	.28	.79
Health Services occupation	0	---	---	---
Percent Female Soldiers	-0.01 (0.01)	.97	.99	1.01
Percent Pregnant/Postpartum Soldiers	-0.01 (0.01)	.98	.99	1.00
Total Impression Management Score	-0.07 (0.12)	.73	.93	1.18
Total Subtle Sexism Score	-0.02 (0.10)	.80	.98	1.18

Note: R^2 = .28 (Cox & Snell), .29 (Nagelkerke). Model X^2 (36) = 89.17, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$

LEADER ATTITUDES TOWARD P3T IMPLEMENTATION AND OUTCOMES (AIM 3B)

A multivariate multiple regression was conducted to assess the possible relationship between attitudes toward P3T reach and implementation and leader attitudes toward the successful goal attainment of the program. Results are depicted in Table 13. Respondents who indicated at least minimal familiarity with P3T were asked about the program (n = 361). SPSS automatically deleted cases with missing variables in a listwise method, resulting in 211 cases included in the analysis. The influence of the independent variables on attitudes toward P3T goal attainment was quite small. Regression analysis indicated that familiarity only accounted for 16.4% of the variance. Nevertheless, these attitudes toward the reach of P3T (as approximated by factor score) were significantly correlated with attitudes toward P3T goal attainment (as approximated by factor score). Other variables included in the model did not indicate a significant relationship with attitudes toward P3T goal attainment.

Table 13. Leader Attitudes toward P3T Goal Attainment by P3T Reach (n = 211)

	B	*SE B*	β
Constant	0.38	.70	
Gender	0.17	.18	.08
Parental Status	0.01	.17	.00
Female Soldiers Led	-0.00	.00	-.03
Pregnant Soldiers Led	0.00	.00	.04
Modern Sexism Scale (MSS)	-0.06	.04	-.12
Impression Management Subscale (IMS)	0.00	.04	-.121
Attitudes toward P3T Reach and Implementation	0.41	.07	.39***
P3T: Very Familiar compared to Heard of P3T	.18	.22	.07
P3T: Very Familiar compared to Somewhat Familiar	.29	.19	.12
P3T: Very Familiar compared to Moderately Familiar	-.06	.18	-.03

Note: R^2 = .15. * p < .05, ** p < .01, *** p < .001

LEADER ATTITUDES TOWARD READINESS FOR FEMALE SOLDIER INTEGRATION (AIM 4)

A multivariate multiple regression was conducted to examine possible relationships between occupational specialty and leader attitudes toward integration readiness. Additional variables were included in this analysis. Listwise case deletion for missing variables in SPSS yielded 207 cases used in this analysis. Results are depicted in Table 14. The influence of the independent variables on attitudes toward integration readiness is small. Regression analysis indicated that the model accounts for 13.0% of the variance in the sample. Occupation was not associated with attitudes toward integration readiness (as approximated by the ALPA factor measuring attitudes toward female integration training adequacy). However, other variables included in the model revealed a statistically significant relationship with attitudes toward female soldier integration readiness. Specifically, the sum of the IMS, parental status, and gender of the respondent were all significantly associated with the factor score for attitudes regarding integration training adequacy.

Table 14. Leader Attitudes toward Integration by Occupation (n = 207)

	B	*SE B*	β
Constant	1.71	0.64	
OD to OSD	-0.16	0.25	-.08
OD to FSD	-0.18	0.23	-.10
Modern Sexism Scale (MSS)	0.02	0.03	.05
Impression Management Subscale (IMS)	-0.10	0.04	-.17*
Parental Status	-0.28	0.14	-.13*
Gender	-0.35	0.14	-.19*
Female Soldiers Led	0.00	0.00	-.01
Pregnant Soldiers Led	0.00	0.00	-.02
OD Units to OSD Units	-0.19	0.22	-.09
OD Units to FSD Units	-0.03	0.19	-.02
OD Units to HSD Units	-0.10	0.21	-.04

Note: OD = Operations Division; OSD = Operations Support Division; FSD = Force Sustainment Division; HSD = Health Services Division; R^2 = .13. * $p < .05$, ** $p < .01$, *** $p < .001$

Respondents were asked to indicate their level of agreement with the statement that they felt comfortable leading both male and female Soldiers. Respondents overwhelmingly endorsed comfort leading both males and females, as 66.9% (n = 281) maxed out the scale at 100 (strongly agree) with that item, and 96.4% (n = 405) endorsed 60 or greater, indicating agreement to some degree. The strongest associations with this pattern of responses to this item were gender ($p < .05$) and serving in an Operations Support unit as compared to an Operations Division unit ($p < .01$). See Supplemental Table S5 in Appendix F. The two items assessing the Army's training of leaders to successfully lead integrated units were merged (one asked the question of currently all-male unit leaders, while the other asked the same question of leaders in fully integrated units). Respondents strongly agreed that the Army has trained them to lead both genders as evidenced by 46.6% (n = 197) endorsing 100 on the scale. A total of 335 (81.7%) endorsed some level of agreement (a score of 60 or greater) with the statement. There were no significant associations with impression management, sexism, gender, or any other variable. Leaders were similarly very confident in the Army's training of both male and female subordinates to complete the mission (M = 78.5, SD = 27.4), with 79.5% (n = 330) expressing agreement (a score of 60 or greater) with the statement.

One scale item concerning integration readiness was excluded from the model due to poor fit. The item gauged whether leaders agreed with the idea that unit cohesion would be more difficult to achieve in a mixed-gender unit (item 40 in Appendix A). One reason is likely because the responses were in a bimodal distribution, where individuals were very clearly divided on attitudes toward integration. While the majority of respondents disagreed with the statement (n = 213, 52.9%, score of 40 or less), a

substantial number agreed with the statement (*n* = 163, 40.4%, score of 60 or greater). Another item addressing integration (with specific regard to pregnancy stigma) was the statement that males would be preferred in the unit because they cannot become pregnant. This item was also excluded from analysis due to poor model fit. Similarly, responses fell in a split distribution with the majority in disagreement (*n* = 203, 49.5%), though a sizeable proportion agreed with the statement (*n* = 150, 36.6%). An additional 13.9% (*n* = 57) neither agreed nor disagreed with the item (range of scores from 41-59).

QUALITATIVE RESPONSES

Two open items were included in the survey to assess leaders' perceptions about barriers to integrating female Soldiers into formerly all-male units, as well as their ideas on possible mitigation strategies for those barriers. These barriers and mitigation strategies were categorized based on common themes represented in the narrative of each response. Single responses frequently included multiple barriers and/or mitigation strategies and were therefore included in several categories. These data were reviewed by the author but have not been independently rated for interrater agreement and will therefore only be briefly addressed here.

Barriers to Integration

A total of 333 individuals provided a response for perceived barriers to integration, which addressed a variety of concerns from gender stereotypes, discrimination, and command climate concerns to sexual assault/harassment, gender relations issues, and differing standards adversely impacting morale and unit cohesion. Responses distributed across a total of fourteen distinct categories of perceived barriers.

Many respondents indicated multiple barriers in their responses and were thus not mutually exclusive categories.

The most common barrier to integration expressed in these responses was gender-based stereotypes (n = 88, 26.4%). Respondents used phrases such as, "the good old boy network" (hypermasculinity) to describe antiquated thinking about male and female capabilities and their perceived impact on performance. A second barrier that was of concern was the idea that sexual assault or harassment incidents would increase after females are integrated (n = 70, 21.0%). Frequently included in these statements were ideas such as the culture of all-male units and how morale is built (i.e., through hazing practices or use of inappropriate/unprofessional language that would be unacceptable in mixed-gender units). With regard to unit culture, 59 individuals (17.7%) indicated that this dynamic and/or lack of leader buy-in (which would influence unit culture) would be a barrier to integration. Physical fitness standards and the differences between males and females in measuring performance were also indicated as a concern for integration. This concept fell in two sub-categories: those who perceived females as having an advantage due to lower expectations (n = 58, 17.4%), and those who perceived that females would always have to over-perform merely to be accepted (n = 30, 9.0%). Of interest to this study, a substantial proportion of open-ended responses to this survey (n = 30, 9.0%) viewed pregnancy, single-parenthood, breastfeeding, and family care plan difficulties as barriers to integrating females into formerly all-male units.

Mitigation Strategies for Integration Barriers

A total of 313 respondents provided mitigation strategies to address the barriers they indicated. Mitigation strategies spanned 16 distinct categories and included themes

such as getting leader buy-in for the integration process, unifying fitness and occupation standards across genders, developing specific training to address integration concerns, and emphasizing equality as much as possible. Consistent with barriers listed, many respondents included multiple mitigation strategies that fell into different categories and were thus not mutually exclusive.

The most common mitigation strategy listed was the maintenance of high/appropriate standards to measure physical fitness (n = 64, 20.4%). Respondents indicated that standards should not be lowered to include female Soldiers based on the idea that these standards should measure the ability of all Soldiers to complete a task. The expectation is that the mission of our fighting force will not change, so standards should continue to measure Soldiers' ability to complete the mission. A second mitigation strategy is to obtain leader buy-in for integration (n = 62, 19.8%). Respondents described leaders who take ownership of the order to integrate, rather than taking the stance of "Big Army" telling them they are obligated to integrate and creating separation between policy and the leader. Respondents also indicated that leaders who fail to adapt to integration policy should be removed from their positions (n = 16, 5.1%). Another major mitigation strategy was an emphasis on training to facilitate integration (n = 48, 15.3%). Training would focus on enhanced sexual assault/harassment prevention, reduction of hazing practices, and greater emphasis on gender-inclusive policies. Of note, 5.4% (n = 17) stated integration should either not happen at all or be delayed well beyond the 2019 deadline.

CHAPTER 4: Discussion

Respondents were likely to be female, Caucasian, non-Hispanic, and in the rank of Captain, which does not correspond to Army demographics. They were also most likely to be in the Force Sustainment occupational specialty division. Despite the relevance with events concurrent with the data collection of this project (e.g., the first women completing Ranger School, the official determination that all women would be eligible for combat roles), it appeared that those who were most likely to participate in this research were not of the majority demographic and instead appear to have a vested interest based on personal relevance. That is, respondents were mostly women who are also parents. One reason for this unexpected sample demographic is that recruiting occurred largely through word-of-mouth and snowball sampling techniques. A large number of respondents were recruited through social media pages devoted to mentorship of female service members. However, the largest number of respondents were recruited through a commonly-used military-specific social media platform. This platform has general ties to broad personnel and administrative information that is accessed by thousands of service members daily.

It is possible that the disproportionate number of female respondents was due to the notion that military pregnancy is still a "woman's issue" and not the concern of all leaders. While integration of female service members across occupations impacts the entire force, it is also possible that the possibility of pregnancy among newly-integrated female service members is not a priority concern to leaders. While on the surface it may seem positive that potential pregnancy is not a major factor in considering female Soldier integration, it is imperative that leaders understand the high prevalence of unplanned

pregnancy among service members and the potential impact on readiness and integration (81; 108).

PREGNANCY ATTITUDES

No differences were discovered between occupational specialty groups with regard to attitudes toward pregnancy. Pregnancy attitudes were strongly associated with scores on the Impression Management Subscale (IMS), scores on the Modern Sexism Scale (MSS), and gender of the respondent. Specifically, with each unit increase of MSS score, the sum of ALPA factor scores was reduced, indicating that more sexist beliefs were associated with more negative pregnancy attitudes. With each unit increase of IMS score, the sum of Army Leader Pregnancy Attitudes (ALPA) factor scores was reduced, indicating less favorable attitudes toward pregnancy as impression management score increased. This finding is surprising, assuming that the more socially desirable response is pregnancy-positive from a societal point of view. However, from the perspective of keeping a strong focus on military readiness, the most socially desirable response may be more in line with limiting pregnancy during military service. Focus groups from the TRAC study on gender integration (2015) reported that male Soldiers reported pregnant females are perceived as "disloyal to their unit, selfish, and not committed to the profession" (p. 24). Finally, female respondents appeared to have more negative attitudes toward pregnancy, as sum of ALPA factor scores decreased when compared to male respondents. This last finding is also surprising, given the fact that many female Soldiers who responded to the survey were also parents while serving. However, Soldier-Moms may be most familiar with the challenges of balancing a military career and parenthood

and thus may have relied heavily on their personal experiences when responding to this survey.

For purposes of this survey, pregnancy attitudes covered a broad spectrum of ideas about pregnancy. Attitudes toward pregnancy stigma, pregnancy-specific training adequacy, pregnancy-related policies, career planning in pregnancy context, pregnancy compatibility with military duties, and several other factors comprise the sum of ALPA factor scores. In general, the sum of ALPA scores reflected more positive attitudes toward pregnancy, including disagreement with pregnancy stigma, more support of pregnancy-protective policies, agreement that additional training support to understanding pregnancy is needed, and agreement that access to healthcare and contraception is needed to promote pregnancy planning.

Personnel Readiness

Similar to general pregnancy attitudes, occupational specialty was not strongly associated with attitudes toward pregnancy's impact on military readiness. The factor score for attitudes toward pregnancy stigma was used as an estimate of attitudes toward military readiness because the factor score was comprised of items regarding pregnancy's impact to readiness as well as stigmas like women using pregnancy as a means to avoid military duties. Higher factor scores indicated stronger disagreement with these views. As above, IMS scores, MSS scores, and gender were strongly associated with readiness attitudes. As the sum of MSS scores increased, the factor score for attitudes toward pregnancy stigma (which included concerns about readiness) decreased. This finding means higher sexism is associated with more agreement with pregnancy-related stigma. However, as IMS scores increased, so did the level of disagreement with pregnancy

stigma (as evidenced by an increase of factor score). Additionally, when comparing males to females, female gender led to an increase in factor score, indicating females more strongly disagreed with pregnancy stigma than males, including the idea that pregnancy has a greater impact on military readiness than any other time-limited medical condition.

The impact of pregnancy to readiness (specifically, deployment readiness) is far exceeded (based on total number of medical encounters) by a variety of other medical conditions, including poisoning, mental health problems, and musculoskeletal injuries (7). Childbirth is the third-ranked reason for hospitalization and ranks second if you include other pregnancy complications, but hospitalizations due to mental health conditions are nearly three times as prevalent (7). While pregnancy and childbirth render a Soldier non-deployable for approximately 15 months, severe mental health conditions cause service members to be non-deployable until the condition has stabilized for at least ninety days if not hospitalized and one year if hospitalization occurred (51). If the severe mental health condition recurs or interferes significantly with job performance, the Soldier must be evaluated for medical fitness to continue military service by an evaluation board (51).

Serious physical health conditions or recurrent health conditions must also be evaluated for continued fitness for duty in the same manner (51). Regardless of these facts, pregnancy does limit female Soldiers from performing some tactical duties (including field exercises and deployments) and does so for a lengthier period than typical musculoskeletal injuries. These concerns, that pregnancy and postpartum recovery

periods adversely impact unit readiness, were expressed by respondents across all occupations.

Most (57.3%) respondents disagreed with the idea that pregnancy adversely impacted unit readiness more than other time-limited injuries or medical conditions. However, the number of people who indicated any level of agreement matched the number who completely disagreed with this concept (scale score of 0). This means that, while the general trend indicates that most respondents view pregnancy as no greater impact on readiness than other time-limited illnesses or medical issues, a not-inconsequential number still hold the attitude that pregnancy has a higher impact on readiness. Regarding female integration and pregnancy, one respondent remarked, "It is an indisputable truth that unit readiness and success will suffer." When Soldiers struggle with effectively planning and managing the timing of pregnancies, it can adversely impact unit readiness at critical periods.

Lack of Soldier education on preventing pregnancy is only part of the problem. Genitourinary health also contributes greatly to unit readiness, and women tend not to seek medical treatment for these concerns (137). Braun and colleagues (2016) reported that while research on genitourinary health conditions for military women has increased in the past decade, little information is known about health care delivery in austere environments for female service members (15). Emphasis on self-diagnosis and treatment of minor vulvo-vaginal health concerns can help female Soldiers to continue their missions in deployed environments and reduce readiness impact (15). The Army Public Health Center (APHC) addressed concerns impacting female Soldiers' genitourinary health management in field/deployed environments in a publication in 2010 (176).

However, this publication may not have sufficient circulation among female Soldiers. A follow-up survey could quickly determine if this is the case.

Deployment readiness is taking higher precedence than ever. Recent changes in the way deployable status is tracked, as well as implications for military retention, signify this change in precedence (107; 166). Now, when service members are placed on deployment-limiting medical profiles, commanders will immediately be notified. Personnel who do not improve their fitness or return to deployable status within 1 year will immediately be recommended for medical evaluation board to assess for whether they will be able to meet fitness for duty requirements and be retained in the military (107; 166). Approximately 50,000 active component Soldiers are non-deployable, or 16 percent, which adversely impact the Army's ability to meet duty requirements during a reduction in forces with continued worldwide demand (168; 183). Fewer than one percent of non-deployable profiles is due to pregnancy (5; 39; 40). However, it remains heavily scrutinized in proportion to other causes of deployment limitation, and will continue to be scrutinized in light of the changes to female assignments into formerly closed units (14; 19; 70-72; 81; 86; 87; 135; 188). Indeed, a substantial proportion of open-ended responses to this survey viewed pregnancy, single-parenthood, breastfeeding, and family care plan difficulties as barriers to integrating females into formerly all-male units. Further, nearly a third expressed some agreement (ranging from 51, slight agreement, to 100, strong agreement) that pregnancy would adversely impact unit readiness more than other time-limited health conditions preventing deployment Thus, it is important to address concerns about female Soldiers who fail to prevent pregnancy (either accidentally

or intentionally) during a deployment cycle, due to the belief that pregnancy adversely impacts unit readiness and female integration into combat units.

FEMALE SOLDIER INTEGRATION CONCERNS

Standards

Recent research has begun to identify specific gaps in female Soldier integration and ways to address these gaps (163). Standards by which all Soldiers are evaluated appear to play a substantial role in successful integration of female Soldiers. A number of respondents indicated standards inequality was a problem on open-ended questions, though for differing reasons. Specifically, respondents indicated standards unfairly gave female Soldiers an advantage because they did not have to achieve the male physical fitness standards. This is not a new concern; the Defense Advisory Committee on Women in the Services (DACOWITS) has consistently stated that physical fitness and job performance standards should be well-researched, validated measures of individual assessment based on occupation-specific requirements and be gender neutral (35). However, a substantial number of respondents also indicated some concerns that women would have to overachieve on standards merely to be accepted.

The onus also appears to be on the female with regard to general behavior, decorum, professionalism, and adherence to standards. A number of open-ended responses appeared to indicate that female Soldiers must be of the highest standards of professionalism, essentially without flaw, to be able to successfully integrate into a formerly closed unit. Scale items did not address fitness standards (other than through P3T) or behavioral concerns among Soldiers who are integrating, but these are among leaders' top concerns as indicated by open-ended responses.

Sexual Assault and Harassment Risk

While no scale items specifically addressed sexual assault or harassment concerns, this was a clear issue raised by respondents in the open-ended items. Respondents indicated a barrier to integration of female Soldiers into formerly all-male units was an anticipated rise in incidents of sexual harassment and assault. A recent study on rape vulnerability in the hypermasculine institution of the military indicated that females may, indeed, be more vulnerable to rape (186). The study indicated the culture itself generates additional "masculinist" stereotypes about males as both perpetrators and necessary protectors, which contributes to the vulnerability in combination with the disproportionate number of women to men (186). Prevalence of sexual assault according to a recent RAND study conducted by Morral and colleagues (2016) indicated 1.5% of the active component experienced sexual assault in the past year. This total was estimated with 95% confidence to be between 18,200 and 22,400 individuals in the active component who had been assaulted out of 1.3 million service members (136). Based on open-ended items in this study, respondents reported concerns that sexual assault, sexual harassment, or other workplace gender-related complaints would increase after integration. Mitigation strategies introduced to specifically address this issue included solutions such as revising the Army's current sexual harassment and assault response and prevention (SHARP) training program and incorporating additional training. The implication of these responses is that a great deal of discomfort exists with regard to integration based on sexual assault/harassment risk. These responses also imply that current SHARP training is insufficient to meet the need of addressing these incidents.

Morale, Unit Cohesion, and Integration Readiness

In the context of other categories, many respondents indicated that the aforementioned barriers to integration (e.g., sexual assault increase, differing standards, existing biases) would all adversely impact unit cohesion generally. Of particular relevance to this study is the concern that pregnancy itself can adversely impact unit cohesion. Three respondents specifically listed pregnancy as a direct contributor to poor unit morale/cohesion. One respondent commented, "Pregnant soldiers destroy the teamwork and structure that has been built over training," as integration occurs.

With increased impression management, attitudes toward integration training adequacy was lower, parents had more negative views toward integration readiness than non-parents, and female respondents' attitudes toward integration readiness were also more negative as compared to male respondents. Respondents overwhelmingly believed that they are comfortable leading both males and females, as two-thirds endorsed a scale score of 100 (strongly agree) with that item. Indeed, only ten individuals endorsed anything below 50, suggesting most respondents had very little discomfort with leading both genders. Respondents generally agreed that the Army has trained them to lead both genders. Leaders were similarly very confident in the Army's training of both male and female subordinates to complete the mission.

There were areas that remain strongly divided with regard to integration readiness, as indicated by the scale items that were excluded from the model. The item discussing unit cohesion among mixed-gender units showed a distinct bimodal distribution, with large proportions in agreement and disagreement with the statement. Another item addressed pregnancy stigma in the context of an integrated unit, based on agreement with the statement that males would be preferred because they cannot become

pregnant. Again, while a greater proportion expressed disagreement, a large number of respondents indicated agreement and more than 10% remained neutral (scale score = 50). This pattern of responses suggests that leaders' attitudes toward female Soldier integration are impacted by their beliefs about building cohesion and the impact of pregnancy in their units.

SOCIAL ECOLOGICAL MODEL

The model in which this study was originally framed, based on Bronfenbrenner's (1977) work on social development in human ecology, not only describes how the female service member fits within the military world, but also her non-military community (17). It is fair to say that female service members are not exclusively the ones who are impacted by their role in each of these communities; their male counterparts are equally a part of this ecological system. "Culture change" was referenced numerous times in respondents' written concerns about integration and in mitigation strategies to reduce barriers to integration.

Culture Change

Culture change as noted by respondents predominantly included addressing biases and long-held stereotypical gender beliefs, as well as promoting a command climate conducive to implementing these changes. In the context of the social ecological model, that may best be handled by an emphasis on equality and unification of gender-based fitness and occupational standards from the macrosystem level (17). The culture change would need to filter down through the subsystems from there, into the Army policy (exosystem), with major command leadership taking ownership of the new policies before disseminating to subordinate commands (mesosystem) and to the lowest-level

units (microsystem). To facilitate integration and to effectively manage military pregnancies, results show a clear indication that culture itself will likely need to change. This study found key areas for culture change consistent with the TRAC study on gender integration (179). These areas include promoting gender equality through uniform standards of occupational fitness, providing adequate training and supervision to ensure the "locker room" culture of all-male units makes way for an environment of dignity and respect, and providing consistent access to healthcare and health education to reduce the risk of unplanned pregnancy (Ibid). With the rapid changes in Army and DoD policy, it is unclear if policy changes are facilitating this culture change or if it is merely mandating an organizational change with little immediate impact to the culture.

LIMITATIONS

There are several limitations to this study that must be considered. These limitations occurred as a result of research design decisions, participant composition, software problems, and missing data.

Sampling Limitations

First, recruitment occurred through snowball sampling techniques. While a substantial number of individuals responded and shared the survey with their colleagues and friends, the degree of variation between individuals is likely quite small. For example, the proportion of responses who were women (65.0%) far exceeded the typical demographic of women in the Army (15-16%). This likely resulted from the distribution of the survey on a mentorship social media page for female Army officers. One way of opening up the diversity of respondents was to request the link be distributed through an Army information distribution channel, via S1Net, a military social network that affects

personnel across all career fields. While this method did improve the diversity of respondents, the demographics of survey completers for this study were not commensurate with the demographics of the Army as a whole. Thus, while sampling was adequate to conduct the analyses as planned, the results do not generalize to all the Army components. In fact, because the majority of the respondents were both women and parents, it suggests that the results are strongly biased according to the attitudes of this specific demographic. While it is certainly important to obtain the attitudes of these leaders toward pregnancy and female integration, it further limits the capacity of this study to generalize to other Army leaders.

Data Loss

A second limitation is that, despite collecting 657 responses, a substantial amount of data was lost. This occurred for two reasons: some respondents opted out early, and some chose to skip items or were prevented from answering due to problems with software.

Survey Drop-Out

Nearly one-fourth of the original respondents did not go on to complete the survey, choosing to drop out prior to completion. These data were excluded from analysis, which reduced the sample size and the power of the study. One possible way to mitigate data loss from drop-out would be to reduce the length of time to complete the survey. Total time to complete all questionnaires was estimated at 25 minutes. However, the target sample included military leaders, whose schedules may have been too full to dedicate time to complete online questionnaires. The survey was enabled with the capability for respondents to return to the survey where they left off if they used the same

computer and web browser in subsequent sessions. However, it is possible that some discontinued the survey without intention to complete it later.

Missing Data and Software Limitations

Those respondents who did go on to complete the survey sometimes did not choose to complete every item, and at other times survey software prevented respondents from answering due to glitches. These difficulties further contributed to data loss. The original survey did not mandate a response for all items, and at times the survey software did not accurately capture intended mean score responses (i.e., a scale score of 50). By mandating responses for every item, and by ensuring the respondent selected 50 (as opposed to leaving the item at the default setting of 50), there would likely have been less missing data. On at least one occasion, survey software also prevented respondents from answering a series of items because the sliding bars were not available to select. Having an option for respondents to send immediate notification to the investigator would have helped mitigate this problem because technical support could have been requested sooner.

Data Imputation Limitations

Replacement with mean scores was used as a way to manage missing data based on case analysis, as discussed in the results. Some items yielded more neutral mean scores (ranging from 41 to 59), particularly when the items required more knowledge base from the respondent or when items appeared to fall into a bimodal distribution. Thus, the strategy to address missing data through mean score replacement was considered less likely to adversely impact overall analyses. Replacement with mean scores was used as appropriate, but data imputation was limited to prevent suppressing standard deviation scores or reducing standard error. Excessive data imputation using a

replace-with-mean method potentially results in erroneous significant results, and this outcome was avoided by limiting imputation.

It was not necessary to impute data at all for the purpose of limiting biased analyses. Given the total missing data comprised about 7% of the critical items, it falls within acceptable limits of the likelihood that missing data would bias the analyses (151). Additionally, mean score replacement on such a small proportion of overall data may not have substantial influence on the overall analyses. However, SPSS software deletes missing cases from analyses based on user selections of listwise or pairwise deletion methods. The software issues caused specific sections of items to be skipped, which would have resulted in a significant loss of data due to automatic deletion from analysis. Thus, although a limited amount of data overall was missing (e.g., small percentage of empty cells in the grid), the pattern of missing data (e.g., where empty cells were concentrated in the grid) would have adversely impacted results.

Non-correction of Multiple Comparisons

This study did not include corrections for multiple comparisons, and the author recognizes it can be considered a limitation of the study. It can reasonably be assumed that normal variability exists among respondents to this survey. Furthermore, the controversial nature of some of the survey items may have led to individuals' responses being less extreme. That is, individuals may have responded more neutrally to some items on the survey, which would decrease the strength of relationship to other items. Indeed, only a few variables were found to be statistically significantly related. As stated in Rothman's (1990) paper on adjustments for multiple comparisons, a conservative

method of controlling for multiple comparisons may lead to an incidental erroneous failure to identify significant relationships by attributing them to chance (147).

CONCLUSIONS AND THE WAY FORWARD

It should be noted that readiness is affected by more than the health of the force. Budget constraints, changes in the way military equipment is funded and distributed to units, and the training status of these units are also key players in determining deployment readiness (120). Additionally, former Army Chief of Staff GEN Odierno stated in 2015 that the budget, equipment, and training limitations, along with mandated reductions in force, have been the biggest contributors to historically low readiness levels across the Army (120). However, as the force shrinks and funding is reduced, it further underscores the importance of Soldiers being available to deploy to meet the Army's mission.

The face of the Army continues to change. The "Don't Ask, Don't Tell" policy was repealed in 2010, which opened all branches of service to openly gay, lesbian, and bisexual service members in 2011 (20). Women have completed the most rigorous, formerly male-only, training the Army has to offer (104; 138). Most recently, it was announced that transgender service members will no longer be barred from military service (29; 149). However, the Army is simultaneously reducing the size of its force to meet budgetary and mission constraints, which adversely impacts female Soldiers and the overall diversity of the Army (111). Racial integration was a very positive social movement that occurred in the military before the society at large (113; 180). However, just as racism persists within American culture despite more than 50 years since the Civil Rights Movement and more than 65 years since racial integration in the military, it is

highly unlikely that LGBTQ and gender biases will quickly dissolve with military integration of these groups.

Future Directions

The opportunity was provided for respondents to enter statements or opinions in free text. As briefly discussed above, more than 300 individuals chose to report their concerns about possible barriers to integrating females into all-male units and proposed methods to mitigate these barriers. Clearly, leaders want their voices to be heard when policies are written to help drive the future of the Army. Future research will extensively analyze the findings of these open-ended responses to help guide policies as females integrate into newly-opened career fields. Another question that may have been beneficial to ask, and is potentially an area for future study, is the perceived value or benefit leaders see of having women serve in their units.

Several aspects of pregnancy impact and female Soldier integration emerged as concerns in the open-response data that were not assessed in the scale items. Specifically, leaders raised concerns about sexual assault/harassment, differences in physical standards, hypermasculinity, and leader buy-in/command climate. This study targeted leader attitudes about pregnancy in the context of female Soldier integration and thus was aimed toward gathering information about those attitudes. However, a clear finding emerged that indicated additional focus should be on the concerns raised by respondents. Specifically, as these careers begin to open to women, future researchers may wish to measure the number of sexual assault and harassment claims, physical standards and musculoskeletal injuries incurred, and command climate in the integrated units. As these concerns were among the highest raised by the respondents in this study, they warrant

review in real-world scenarios. Future efforts to mitigate integration problems may benefit from additional focus on these concerns, as well as implementing new techniques to reduce the overall incidence of harassment, assault, and physical injury.

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APPENDIX A:
Army Leader Pregnancy Attitudes

1. I am currently serving in the United States Army on active duty/National Guard/Reserves OR was actively serving in any of these roles in the United States Army **in the past year**.
(1) YES, currently. (2) Not currently, but I was in the past year. (3) NO **(IF NO, thank for participation and end survey) (If in the past year, questions follow the "b" pattern)**

2. I am an officer/non-commissioned officer who is currently in a leadership position of a company/battery/troop element, hospital clinic, OR higher element (e.g., battalion, squadron, brigade, hospital, etc.).
(1) Yes, in command/responsibility (2) Not in command/responsibility, but in another leadership role. (3) No, not in a leadership role.
2b. When I served, I was an officer/non-commissioned officer in a leadership position of a company/battery/troop element, hospital clinic, OR higher element (e.g., battalion, squadron, brigade, hospital, etc.).
(1) Yes, in command/responsibility (2) Not in command/responsibility, but in another leadership role. (3) No, not in a leadership role.

3. What is your current age in years? **(Whole number only) (If age < 18, thank for participation and end survey)**

4. My current duty location is:
(1) CONUS (**inside** the 48 contiguous United States)
(2) OCONUS (**outside** the 48 contiguous United States; e.g., Alaska, Hawaii, Europe, Japan, Korea)
4b. When I served as a leader, my duty location was:
(1) CONUS (**inside** the 48 contiguous United States)
(2) OCONUS (**outside** the 48 contiguous United States; e.g., Alaska, Hawaii, Europe, Japan, Korea)

5. What installation? **(Drop-down list; divided into CONUS and OCONUS locations based on selection from item 4; Comments section added if individual selects that their location is not listed, so they may add it.)**

6. What is your gender? Male (1) Female (2)

7. What is your ethnicity?
(1) Hispanic/Latino-a (2) Non-Hispanic/Latino-a

8. What is your race?
(Drop-down list)
American Indian or Alaska Native (1)
Asian (2)
Black or African American (3)
Native Hawaiian or Other Pacific Islander (4)
White (5)
Two or More Races (6)
Other (7)

9. How many years of active federal service do you have? **(Whole number only)**

10. Did you become a parent while on active duty **OR** were you a parent at any point during your active duty career?
YES (1) NO (2)

11. Please select your current rank (**OR** the highest rank held if you are no longer on active duty): **(DEVELOPER: Drop-down list of all ranks, to be sorted automatically into the following categories:)**

Junior Noncommissioned Officer (SGT, SSG, SFC) (1)	Senior Noncommissioned Officer (MSG, 1SG, SGM, CSM) (2)	Junior Officer (WO1, CW2, 2LT, 1LT, CPT) (3)	Senior Officer (CW3, CW4, CW5, MAJ, LT COL, COL, General Officer) (4)

12. What is **your** Occupational Specialty?
12b. What was your occupational specialty when you were in a leadership role)?
(DEVELOPER: Drop-down list of all specialties, to be sorted automatically into the following categories:)

Operations (IN, AR, EN, SOC, etc.) (1)	Operations Support (SC, MI, PAO, FAO, etc.) (2)	Force Sustainment (LG, QM, FI, AG, etc.) (3)	Health Services (MC, NC, MS, VC, etc.) (4)

13. What is the primary Occupational Specialty in your **unit**?

13b. What was the primary Occupational Specialty in the unit in which you held a leadership role? **(DEVELOPER: Drop-down list of all specialties, to be sorted automatically into the following categories:)**

Operations (IN, AR, EN, SOC, etc.) (1)	Operations Support (SC, MI, PAO, FAO, etc.) (2)	Force Sustainment (LG, QM, FI, AG, etc.) (3)	Health Services (MC, NC, MS, VC, etc.) (4)

14. Please enter the total number of Soldiers currently under your leadership. If you are unsure, please make your best estimate.

14b. Please enter the total number of Soldiers who were under your leadership when you served. If you are unsure, please make your best estimate. **(Whole numbers allowed only.)**

15. Please enter the total number of **female** Soldiers currently under your leadership. If you are unsure, please make your best estimate. If you have not led any female Soldiers, enter **0**.

15b. Please enter the total number of **female** Soldiers under your leadership when you served. If you are unsure, please make your best estimate. If you have not led any female Soldiers, enter **0**. **(Whole numbers allowed only.)**

16. Please enter the total number of **pregnant** and **postpartum** Soldiers currently under your leadership. If you are unsure, please make your best estimate. If you have not led any pregnant or postpartum Soldiers, enter **0**.

NOTE: Postpartum means the person has given birth within the past six months (180 days).

16b. Please enter the total number of **pregnant** and **postpartum** Soldiers under your leadership when you served. If you are unsure, please make your best estimate. If you have not led any pregnant or postpartum Soldiers, enter **0**.

NOTE: Postpartum means the person has given birth within the past six months (180 days). **(If previous response = 0, this item is skipped automatically.)**
(DEVELOPER: automatically calculate % female and % pregnant/postpartum in separate fields.)

Pregnancy and Postpartum Physical Training (P3T)

The Army developed Pregnancy and Postpartum Physical Training (P3T) to provide a way for pregnant and postpartum Soldiers to safely maintain their

fitness during pregnancy as well as recover and improve their fitness and attain height/weight standards postpartum. One of the primary goals of P3T is to keep female Soldiers fit and help them return to standards within the 180-day requirement postpartum. The long term goal of P3T is to achieve a balance in Soldier health and support of the mission.

17. How would you best describe your level of familiarity with P3T? (select **one**)

I have never heard of P3T. (1)
I have heard of P3T but am unfamiliar with its requirements. (2)
I am somewhat familiar with P3T and its requirements. (3)
I am moderately familiar with P3T and its requirements. (4)
I am very familiar with P3T and its requirements. (5)

If participant responded (1), SKIP TO Policies and Training Regarding Pregnancy in Operational Units. If participant answered (2), (3), (4), or (5), please go on to the next set of questions.

18. P3T is in operation at my current installation.

18b. P3T was in operation at my installation when I served in a leadership role.

Yes (1) No (2) Not sure (3)

If participant responded (2) or (3), SKIP TO P3T Implementation Proposal. If participant answered (1), please go on to the next set of questions.

Policies and Implementation of P3T

The following items address leader opinions about how P3T currently operates at your installation. If you are no longer serving, please consider the P3T operations at your installation when you were in a leadership role. Please rate your level of agreement with the following statements, ranging from STRONGLY DISAGREE (0) to STRONGLY AGREE (100).

19. Soldiers from **multiple** units across my installation participate in P3T.

STRONGLY DISAGREE STRONGLY AGREE

20. NCOs and/or Officers from **multiple** units across my installation are responsible for running P3T.

STRONGLY DISAGREE STRONGLY AGREE

21. My operational tempo (OPTEMPO) **does not** impact whether NCOs from my unit are allowed to train and serve as P3T leaders.
STRONGLY DISAGREE STRONGLY AGREE

22. **Most** commanders at my installation appear to support P3T.
STRONGLY DISAGREE STRONGLY AGREE

23. P3T provides **safe** fitness training for Pregnant/Postpartum Soldiers.
STRONGLY DISAGREE STRONGLY AGREE

24. P3T is achieving its goals to train women to **maintain their fitness** during pregnancy.
STRONGLY DISAGREE STRONGLY AGREE

25. P3T is achieving its goals to train women to meet **fitness (APFT)** requirements postpartum (after pregnancy).
STRONGLY DISAGREE STRONGLY AGREE

26. P3T is achieving its goals to train women to meet **height/weight (body composition)** requirements postpartum (after pregnancy).
STRONGLY DISAGREE STRONGLY AGREE

27. The P3T mission is **compatible** with the mission to ensure safe, effective physical readiness training (PRT) for all of my Soldiers.
STRONGLY DISAGREE STRONGLY AGREE

P3T Implementation Proposal
Please answer the following question, **even if** P3T is not operating (or you are unsure if it is operating) at your installation.

28. In your professional opinion, how should P3T be **implemented**? (select **one**):

P3T instruction and training should be web-based only, with **individual Soldiers** assuming responsibility for **their own** fitness and nutrition care using the tools they are provided. (1)
P3T instruction and training should be web-based only, with the **support** of small group leaders who are **certified** to lead safe exercise/fitness instruction. (2)
P3T instruction and training should be web-based **and** face-to-face, with the **support** of small group leaders who are **certified** to lead safe exercise/fitness instruction. (3)

P3T should be **discontinued** because Soldiers need to be **with their units**, doing modified versions of unit physical readiness training as they are able. They can obtain all the education needed from their healthcare provider. (4)
Other implementation strategy (Please briefly describe). (5)

COMMENTS: **(Required if option 5 is selected)**

Policies and Training Regarding Pregnancy in Operational Units

The repeal of the combat exclusion in January, 2013 means that all-male units will be required to include females by January, 2016. Some official changes to policies have already been made concerning assignments of female Soldiers to combat units. These changes are ongoing. The following items give you the opportunity to provide a better understanding of leaders' views on policies and training needs in advance of this requirement.

Policies. As policies to integrate women into all-male units are being developed, it is important to get leaders' opinions about what might work best. There are no right or wrong answers, and your opinions are valuable. Please rate your level of agreement with the following statements, ranging from STRONGLY DISAGREE (0) to STRONGLY AGREE (100).

29. Women who intend to become pregnant within the deployment cycle should not be assigned to deploying/combat units.
STRONGLY DISAGREE STRONGLY AGREE

30. Women who become pregnant while assigned to deploying/combat units should be reassigned to a non-deploying unit (i.e., not left on rear detachment).
STRONGLY DISAGREE STRONGLY AGREE

31. Long-acting contraceptives (e.g., intra-uterine devices, hormonal implants, or hormonal injections) should be required for women in units preparing for deployment.
STRONGLY DISAGREE STRONGLY AGREE

32. Bonuses or incentives should be established for **all personnel** (including non-pregnant and male Soldiers) who maintain deployable status while serving in units preparing for deployment.
STRONGLY DISAGREE STRONGLY AGREE

COMMENTS OR OTHER SUGGESTIONS:

Training. Leaders and fellow male Soldiers who have had little opportunity to serve with female Soldiers are often unfamiliar with key policies impacting female Soldiers. Even

leaders who do serve with female Soldiers may feel they could use additional training to better understand these policies. If you are no longer serving, please consider your unit's needs when you served as a leader. Please rate your level of agreement with the following statements, ranging from STRONGLY DISAGREE (0) to STRONGLY AGREE (100).

33. I need additional support/professional development/education as a leader to familiarize myself with **policies** directly affecting female Soldiers who are pregnant or postpartum.
STRONGLY DISAGREE STRONGLY AGREE

34. Soldiers in my unit need additional support/professional development/education to familiarize themselves with **policies** directly affecting female Soldiers who are pregnant or postpartum.
STRONGLY DISAGREE STRONGLY AGREE

35. My Soldiers (male and female) need additional support/professional development/education to better understand the Army's **expectations** of being a Soldier-Parent.
STRONGLY DISAGREE STRONGLY AGREE

COMMENTS OR OTHER SUGGESTIONS:

Female Integration into Previously Closed Units
Female Soldiers have already begun to transition into some formerly closed units. Many leaders have opinions about how successful this transition can be. These opinions could be based on the Army's preparation of leaders and units, as well as units' readiness to accept this transition. If you are no longer serving, please consider how it was for you when you served as a leader. Please rate your level of agreement with the following statements, ranging from STRONGLY DISAGREE (0) to STRONGLY AGREE (100).

36. I am comfortable leading **both** male and female Soldiers.
STRONGLY DISAGREE STRONGLY AGREE

37. The Army has **adequately trained** me as a leader to support the integration of females within my unit. **(Item only available if # of females in unit = 0.)**
STRONGLY DISAGREE STRONGLY AGREE

38. The Army has **adequately trained** me to lead both male and female Soldiers in my unit. **(Item only available if # of females in unit > 0.)**
STRONGLY DISAGREE STRONGLY AGREE

39. I am confident in the Army training that **all** of my Soldiers (male or female) have received to successfully complete my unit's mission.
STRONGLY DISAGREE STRONGLY AGREE

40. If I am honest, I believe I would/do have to work **harder** to build unit cohesion in a unit with male and female Soldiers than I would/do in an all-male unit.
STRONGLY DISAGREE STRONGLY AGREE

41. What potential barriers do you foresee that would adversely impact the integration of female Soldiers into previously closed units?

42. What recommendations would you make to decision-makers about how to address and remove the barriers you listed in the previous item?

Pregnancy Perspectives

Between 4-9% of female Soldiers become pregnant each year in the Army. Many leaders and fellow Soldiers have a broad range of opinions about pregnancy on active duty. Please rate your level of agreement with the following statements, ranging from STRONGLY DISAGREE (0) to STRONGLY AGREE (100).

43. Pregnancy would adversely impact my unit readiness **more** than other similarly time-limited non-deployable conditions.
STRONGLY DISAGREE STRONGLY AGREE

44. A pregnant Soldier should be rated on her job performance, just like everyone else. Pregnancy should not adversely impact the evaluation.
STRONGLY DISAGREE STRONGLY AGREE

45. If I am honest, I believe that male service members are **generally** preferred in my unit because they will not get pregnant before deployment.
STRONGLY DISAGREE STRONGLY AGREE

46. The idea that some female Soldiers get pregnant on purpose to avoid training exercises or deployment is **generally** not true.
STRONGLY DISAGREE STRONGLY AGREE

47. The idea that some female Soldiers get pregnant on purpose to avoid the APFT or body composition assessments is **generally** not true.
STRONGLY DISAGREE STRONGLY AGREE

48. More than half of pregnant Soldiers did not plan their pregnancies (i.e., their current pregnancy was unwanted/unplanned).
STRONGLY DISAGREE STRONGLY AGREE

49. More birth control options should be available to female Soldiers to prevent unwanted/unplanned pregnancy.
STRONGLY DISAGREE STRONGLY AGREE

50. Female Soldiers are not getting sufficient health education to prevent unwanted/unplanned pregnancy.
STRONGLY DISAGREE STRONGLY AGREE

51. Pregnancy is compatible with continued, successful military service.
STRONGLY DISAGREE STRONGLY AGREE

52. If I am honest, I would say that if women want to be successful career military leaders, they should not have children while on active duty.
STRONGLY DISAGREE STRONGLY AGREE

53. There is a good time during a military career to become pregnant.
STRONGLY DISAGREE STRONGLY AGREE

54. Some military occupations are better suited for pregnancy and parenthood than others.
STRONGLY DISAGREE STRONGLY AGREE

Command Response to Pregnancy within the Unit

Many policies are already in place about how to manage pregnancy within the unit. However, not all leaders are familiar with these policies or, if they are, do not agree on how to best implement them. Additionally, the direct impact of pregnancy within the unit is not well known. Your opinions are valuable in helping to better understand how unit personnel and leaders manage pregnancy. If you are no longer serving, please consider how you would have managed (or did manage) pregnancy while serving as a leader. Please rate your level of agreement with the following statements, ranging from STRONGLY DISAGREE (0) to STRONGLY AGREE (100). **(SERIES OF QUESTIONS ONLY AVAILABLE IF # FEMALES > 0)**

55. I do/would reassign pregnant Soldiers to other duties **within** my unit if their pregnancy limits them from meeting the physical demands of their currently assigned duties.
STRONGLY DISAGREE STRONGLY AGREE

56. I do/would reassign pregnant Soldiers to other duties **within** my unit if they could potentially be exposed to hazardous working conditions or chemicals.
STRONGLY DISAGREE STRONGLY AGREE

57. I do/would request reassignment **to another unit** for my pregnant Soldiers because they cannot meet the qualifications of serving in this unit while pregnant.
STRONGLY DISAGREE STRONGLY AGREE

58. Reassignment of Soldiers for reason of pregnancy should not adversely impact their performance evaluations or promotion eligibility.
STRONGLY DISAGREE STRONGLY AGREE

59. It is uncommon for pregnant Soldiers to experience negative remarks about their pregnancy from their fellow Soldiers.
STRONGLY DISAGREE STRONGLY AGREE

60. I do/would expect pregnant Soldiers under my leadership to inform me of negative remarks about their pregnancy.
STRONGLY DISAGREE STRONGLY AGREE

61. Some of my non-pregnant Soldiers may feel resentful because their workload may increase during the pregnancy of fellow Soldiers.
STRONGLY DISAGREE STRONGLY AGREE

62. Attitudes about pregnancy in the workplace make my job as a leader more challenging.
STRONGLY DISAGREE STRONGLY AGREE

63. Negative remarks about pregnancy should be considered harassment and should be addressed similarly to any other harassing statements or actions.
STRONGLY DISAGREE STRONGLY AGREE

64. I do/would honor pregnancy profiles (to include prescribed work-rest schedules) without question.
STRONGLY DISAGREE STRONGLY AGREE

APPENDIX B:
Impression Management Subscale

This brief, anonymous survey addresses personal style that may influence leadership, decision-making, and other personal factors that may affect climate and culture. **There are no right or wrong answers**, and it is important to respond honestly and according to your first reactions.

1. If I could get into a movie without paying and be sure I was not seen I would probably do it.	*True*	*False*
2. There have been occasions where I took advantage of someone.	*True*	*False*
3. I'm always willing to admit it when I make a mistake.	*True*	*False*
4. I sometimes try to get even rather than forgive and forget.	*True*	*False*
5. I am always courteous, even to people who are disagreeable.	*True*	*False*
6. I would never think of letting someone else be punished for my wrongdoings.	*True*	*False*
7. I am sometimes irritated by people who ask favors of me.	*True*	*False*
8. I have never deliberately said something that hurt someone's feelings.	*True*	*False*

APPENDIX C:
Modern Sexism Scale

This brief, anonymous survey addresses personal beliefs about the culture that may impact women, both inside and outside of the military. **There are no right or wrong answers**, and it is important to respond honestly and according to your first reactions.

1. Discrimination against women is no longer a problem in the United States.	*True*	*False*
2. Women often miss out on good jobs due to sexual discrimination.	*True*	*False*
3. It is rare to see women treated in a sexist manner on television.	*True*	*False*
4. On average, people in our society treat husbands and wives equally.	*True*	*False*
5. Society has reached the point where women and men have equal opportunities for achievement.	*True*	*False*
6. It is easy to understand the anger of women's groups in America.	*True*	*False*
7. It is easy to understand why women's groups are still concerned about societal limitations of women's opportunities.	*True*	*False*
8. Over the past few years, the government and news media have been showing more concern about the treatment of women than is warranted by women's actual experiences.	*True*	*False*

APPENDIX D:
Consent to Participate (web-based consent)

You have been asked to complete three brief surveys that will (in total) take no more than 20 minutes of your time. You have been asked to take part in these surveys because your support is needed in gathering leaders' perceptions on pregnancy in the Army and female Soldier integration into formerly closed units. Your participation is **voluntary**. Refusal to participate will not result in any punishment or loss of benefits to which you are otherwise entitled. Please read the information below before deciding whether to participate.

Purpose. The purpose of these surveys is to gather leaders' perceptions within multiple occupational specialties with regard to a variety of topics related to pregnancy and female integration into all-male units. Due to the repeal of the combat exclusion (Risk Rule) in January, 2013, all-male units will be required to include females by January, 2016. As a military leader, you are uniquely poised to provide decision-makers with your views based on your experience as a leader of Soldiers.

If you agree to participate in this survey, you will be asked to answer a series of questions about:

- your views on pregnancy in the military,
- knowledge about Pregnancy and Postpartum Physical Training (P3T),
- your views on policies that should be implemented with regard to female integration into formerly all-male units,
- your decision-making style, and
- other views about the social culture (both in and out of the military) that may affect females.

Risks and Benefits. There are no foreseeable risks to participating in this survey. You will receive no direct benefit from participating in this survey; however, these surveys give you the opportunity to help guide decision-makers about the operating environment and policies and training needs to effectively meet the requirements of the repeal of the combat exclusion. Your input may help to inform decision-makers with regard to current policies and programs that impact female Soldiers, including pregnant and postpartum Soldiers (those who have given birth within the last six months).

Confidentiality. Your information will be protected to the fullest extent of the law. Any potentially identifying information (PII) will be protected from unauthorized access, and all data used from the survey will be anonymous and will not be linked to identifying data. You may withdraw from participation at any time, even after beginning the survey, by simply closing your browser.

Point of Contact. Prior, during or after your participation you can contact the researcher **CPT Sarah J. McCreight** at **sarah.mccreight@usuhs.edu** for any questions or if you feel that you have been harmed. You may also contact the Director of Human Subjects Protection Program at the Uniformed Services University of the Health Sciences, Bethesda, Maryland 20814-4799 at (301) 295-9534.

If you would like to participate, please **PRINT THIS PAGE** for your records.

STATEMENT BY PERSON AGREEING TO PARTICIPATE IN THIS RESEARCH PROJECT:
I have read this consent form and I understand the procedures to be used in this study and the possible risks, inconveniences, and/or discomforts that may be involved. All of my questions have been answered. I freely and voluntarily choose to participate. I understand that I may withdraw at any time.

BY CLICKING ON THE "YES..." BUTTON, YOU ARE AGREEING THAT YOU HAVE READ THE CONSENT FORM AND UNDERSTAND THE PROCEDURES TO BE USED IN THIS STUDY. YOU ALSO AGREE THAT YOU FREELY AND VOLUNTARILY CHOOSE TO PARTICIPATE AND UNDERSTAND THAT YOU MAY WITHDRAW AT ANY TIME.

Are you willing to participate in this survey?

Yes, I am willing to participate. No, I do not wish to participate.

APPENDIX E:
Consent to Participate in Follow-Up (web-based consent)

(AT CONCLUSION OF SURVEY)

We would like to validate the results of this survey by asking you to repeat a portion of this survey in 2-4 weeks. Participation in this follow-up is **voluntary**. If you choose to participate in this validation, please enter your valid email address in the box below. It does **NOT** have to be an official (.mil) address. You will be contacted by the study lead with a web-link to this survey.

Privacy. Protection of your privacy is important to us. Your responses will be assigned an identification number to match these responses with your responses on the follow-up. Once an identification number is assigned, your responses will no longer be associated with any personal information. Your email address will be deleted from the final data set so that your responses remain anonymous. If you agree to participate, please enter your email below:

(Space for entering email)

APPENDIX F:
Supplementary Tables and Figures

SUPPLEMENTAL TABLES

Table S1 displays the population demographics by component and rank structure. The demographic data are available from the Defense Manpower Data Center (DMDC) and were selected based on the month and year data collection concluded (December 2015) based on final response received (37; 38). Column totals are presented with percentages of each rank category by component and percent of each component represented in the total population. Rank category totals indicated in the final column include percentages of each rank category in the total population.

Table S1. Population Demographics by Component and Rank Category as of December 2015 (N = 561,730)

	Army National Guard		**Army Reserves**		**Active Duty**		**Total**	
RANK CATEGORY								
Junior NCO	125,297	(69.6%)	68,774	(61.0%)	160,983	(59.9%)	355,054	(63.2%)
Senior NCO	9,462	(5.3%)	7,353	(6.5%)	14,353	(5.3%)	31,168	(5.5%)
Junior Officer	29,772	(16.5%)	20,831	(18.5%)	56,929	(21.2%)	107,532	(19.1%)
Senior Officer	15,522	(8.6%)	15,799	(14.0%)	36,655	(13.6%)	67,976	(12.1%)
TOTAL	**180,053**	**(32.1%)**	**112,757**	**(20.1%)**	**268,920**	**(47.9%)**	**561,730**	

Note: Junior NCO includes the ranks of Sergeant, Staff Sergeant, and Sergeant First Class (E5-E7); Senior NCO includes the ranks of Master Sergeant, First Sergeant, Sergeant Major, and Command Sergeant Major (E8-E9); Junior Officer includes the ranks of Warrant Officer 1, Chief Warrant Officer 2, Second Lieutenant, First Lieutenant, and Captain (WO1, CW2, O1-O3); Senior Officer includes the ranks of Major, Lieutenant Colonel, Colonel, and all General Officers (O4-O10); Percentages may not add up to 100% due to rounding.

Table S2 shows the component correlation matrix for the Army Leader Pregnancy Attitudes (ALPA) questionnaire. The matrix indicates whether there can be an assumption of independence of components. Correlations between components are relatively low, with the exception of a weak correlation between components 1 and 6, and between components 1 and 8.

Table S2: Component Correlation Matrix for ALPA Questionnaire (n = 287)

Component	1	2	3	4	5	6	7	8
1	1.000	.141	-.134	-.018	-.099	-.230	-.133	-.345
2	.141	1.000	-.028	.036	.004	-.190	-.046	.030
3	-.134	-.028	1.000	-.010	-.066	.073	-.094	-.008
4	-.018	.036	-.010	1.000	-.066	-.073	.009	-.012
5	-.099	.004	-.066	-.066	1.000	.054	.136	.125
6	-.230	-.190	.073	-.073	.054	1.000	.137	.156
7	-.133	-.046	-.094	.009	.136	.137	1.000	.146
8	-.345	.030	-.008	-.012	.125	.156	.146	1.000

Note: Verbatim survey items comprising each component are in Appendix A; 1 = Pregnancy Stigma, 2 = Pregnancy Policy, 3 = Training Adequacy, 4 = Career Planning, 5 = Work Environment, 6 = Integration Training, 7 = Pregnancy Prevention, 8 = Duty Compatibility.

Table S3 shows the component correlation matrix for the Pregnancy and Postpartum Physical Training (P3T) Subscale. This matrix is derived from the two components in the model using the data from 324 respondents. This matrix suggests a weak correlation exists between components 1 and 2. Thus, independence of components cannot be assumed.

Table S3: Component Correlation Matrix for P3T Items (n = 324)

Component	1	2
1	1.000	.379
2	.379	1.000

Note: Verbatim survey items comprising these components are in Appendix A; 1 = P3T Goals, 2 = P3T Reach.

Table S4 shows correlations at time one and time two for each of the 26 items included in the overall analysis. Of the 26 items in the analyses, two items (indicated by SE and CR in the table) were not significantly correlated over time. These items assessed whether leaders agreed that Soldiers needed more education on pregnancy and whether leaders agreed that pregnant Soldiers should be reassigned to other work areas in the unit to avoid exposure to chemicals or other hazardous materials. The data in Table S3 are truncated; only comparisons between time one and time two are displayed.

Table S4. ALPA Questionnaire Correlation Coefficients at Time One and Time Two

		Time	Two												
AA	BC	UP	PC	NK	PP	OP	PR	CR	UR	RI	RU	SR	WA	NR	WR
-.19*	.04	-.13	-.17	.28**	.18	.45***	.21*	.04	.40***	-.06	.12	.25*	.25*	-.13	-.04
-.18	.03	-.18	-.18	.25*	.10	.31**	.18	-.04	.51***	-.14	.05	.31**	.26*	-.12	.05
.05	.32**	.17	-.12	.05	.05	-.14	.12	.02	.19	-.08	.10	.12	.11	.00	-.09
-.14	.28*	.17	.13	-.14	-.06	.00	.22*	.30**	.02	.13	-.13	.00	.10	.27*	.22*
.01	.17	.06	.31**	-.17	.16	.07	.47***	.41***	.07	.38**	-.17	-.06	-.09	.34**	.29**
.04	-.16	-.05	.07	-.20*	.04	-.03	.09	.04	-.24*	.42***	.06	-.24*	-.22*	.39***	.22*
.00	-.34**	-.42***	-.08	.05	-.08	.04	-.04	.04	.05	.20*	.05	-.12	-.14	.12	.13
.00	.14	-.09	.26*	-.12	.09	.10	.22*	.28**	-.09	.15	-.05	-.13	-.12	.30**	.07
-.36**	.11	.03	-.27**	.32**	.27**	.29**	.08	-.09	.48***	-.42***	.04	.46***	.34**	-.43***	-.23*
.52***	.03	.01	.10	-.09	-.27**	-.12	.28**	.19	-.06	.38***	.01	-.16	-.18	.47***	.26*
.55***	.02	.00	.32**	-.23*	-.19*	-.11	.01	.05	-.30**	.47***	.14	-.27*	-.10	.53***	.19*
	.68***	.40**	.01	.25*	-.08	.04	.24*	.07	.19	-.18	-.05	.07	.08	-.29**	-.10
		.61***	-.04	.16	-.18	-.01	.22*	.10	.12	-.13	-.03	.08	.05	-.09	-.10
			.54***	-.41***	.17	.05	.24*	.30**	-.20*	.54***	.03	-.19	-.29**	.42***	.31**
				.68***	-.14	.12	.02	-.09	.31**	-.30**	-.07	.23*	.18	-.28**	-.20*
					.67***	.14	.27*	.12	.21*	.01	.14	-.07	-.10	.06	.12
						.47***	.17	.21*	.28*	-.04	.31**	.03	-.02	-.17	-.12
							.60***	.23*	.12	-.04	-.14	.04	-.27*	.10	.00
								.17	-.06	.22*	-.17	-.15	-.29*	.52***	.18
									.56***	-.36**	-.01	.23*	.03	-.14	-.01
										.76***	.00	-.38**	-.34**	.69***	.41**
											.60***	-.08	-.05	-.07	-.06
												.57***	.18	-.17	-.37**
													.42**	-.08	-.06
														.79***	.47***
															.60***

Time One	LA	RA	LE	SE	SP	CL	LT	CT	IR	AT
LA	.75***	.42***	.10	-.07	-.15	-.09	-.08	.04	.55***	-.27**
RA		.57***	.00	-.17	-.19	.00	-.10	.05	.55***	-.21*
LE			.29**	.16	.19	.22*	-.16	-.04	.13	-.02
SE				.20	.29**	-.06	.12	.11	.01	-.13
SP					.32**	.05	.23*	.15	-.20*	.01
CL						.55***	.30**	.25*	-.21*	.08
LT							.50***	.31**	-.24*	.08
CT								.56***	-.25*	.01
IR									.77***	-.34**
AT										.75***
AA										
BC										
UP										
PC										
NK										
PP										
OP										
PR										
CR										
UR										
RI										
RU										
SR										
WA										
NR										
WR										

Note: LA = limit assignment to deploying units, RA = reassign pregnant women out of deploying units, LE = leader education regarding pregnancy needed, SE = soldier education regarding pregnancy needed, SP = education on being a soldier-parent needed, CL= comfortable leading males and females, LT = adequately trained as a leader, CT = confidence in training, IR = pregnancy will impact readiness, AT = pregnancy to avoid training, AA = pregnancy to avoid APFT, BC = more access to birth control, UP = prevention of unplanned pregnancy, PC = pregnancy is compatible with service, NK = women should not have kids, PP = pregnancy planning in career, OP = occupations better suited for pregnancy/parenthood, PR = reassignment due to physical limitation, CR = reassignment to prevent chemical exposure, UR = reassign out of the unit due to poor fit, RI = reassignment impact on work, RU = negative remarks uncommon, SR = non-pregnant soldiers' resentment, WA = workplace attitudes about pregnancy, NR = negative remarks are harassment, WR = honoring work-rest profiles. * Correlation is significant at the $p < .05$ level (one-tailed), ** Correlation is significant at the $p < .01$ level (one-tailed), *** Correlation is significant at the $p < .001$ level (one-tailed).

Table S5 shows the results of regression analysis of comfort leading male and female Soldiers by occupational specialty, with other variables of interest including sexist beliefs, impression management, unit type, gender, and experience leading female Soldiers (by percentage of total personnel led) and pregnant Soldiers (by percentage of female personnel led).

Table S5. Leader Attitudes toward Comfort Leading Male and Female Soldiers by Occupation (n = 236)

	B	*SE B*	β
Constant	80.01	9.43	
OD to OSD	-3.23	3.76	-.10
OD to FSD	0.63	3.34	.02
Modern Sexism Scale (MSS)	-0.57	0.45	-.09
Impression Management Subscale (IMS)	0.78	0.59	.08
Parental Status	3.02	2.10	.09
Gender	4.37	2.78	.11*
Female Soldiers Led	0.05	0.04	.08
Pregnant Soldiers Led	0.01	0.03	.02
OD Units to OSD Units	8.75	3.33	.26**
OD Units to FSD Units	3.42	2.78	.11
OD Units to HSD Units	3.25	3.10	.09

Note: OD = Operations Division; OSD = Operations Support Division; FSD = Force Sustainment Division; HSD = Health Services Division; R^2 = .13. * $p < .05$, ** $p < .01$, *** $p < .001$

SUPPLEMENTAL FIGURES

Figure S1 depicts the conceptual model of the main variables and relationships tested for Aim 2, Question 2b, regarding leaders' attitudes toward pregnancy-related stigma. Stigma was a latent variable as measured by Component 1 of the ALPA.

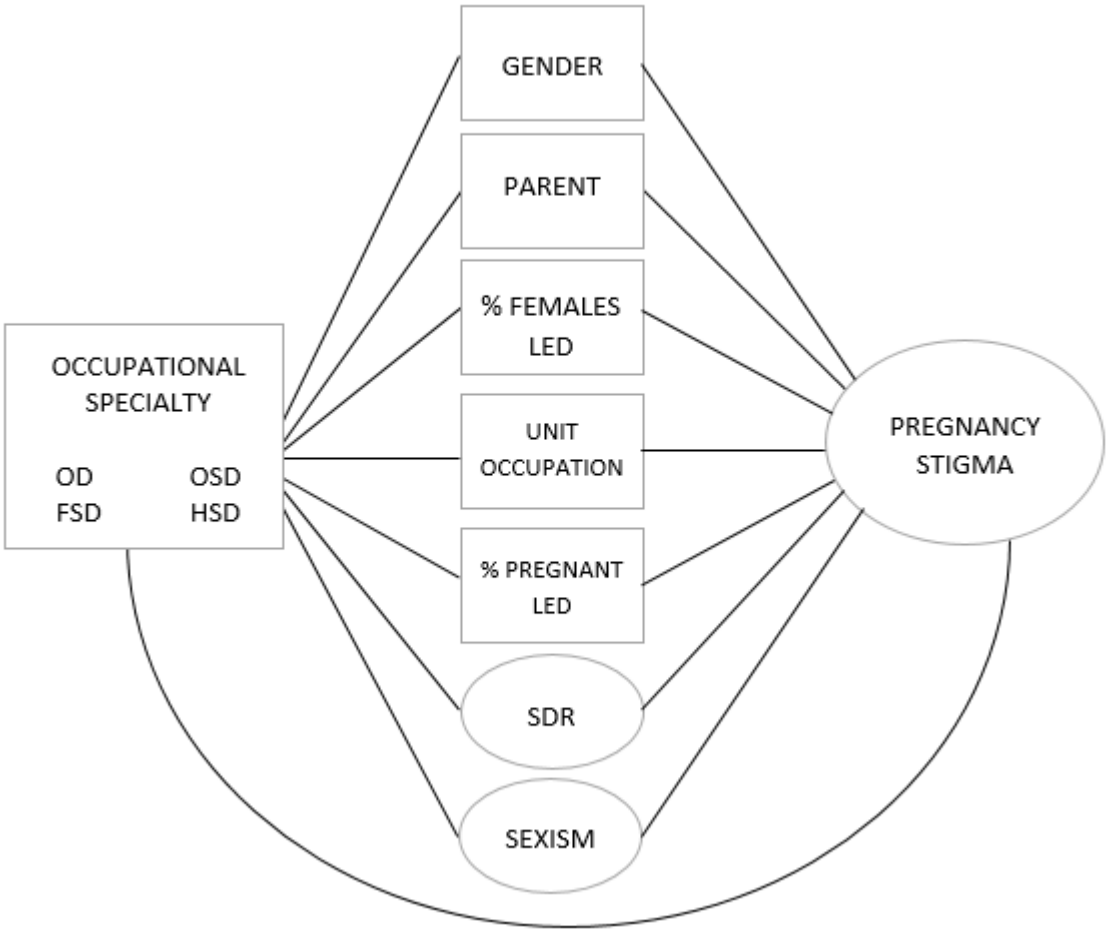

Figure S1. Conceptual Model of Aim 2, Question 2b, Pregnancy Stigma. Conceptual model depicting the relationships tested in the research question, "Do leaders have differing levels of agreement with pregnancy stigma and views on the impact of pregnancy to readiness by occupational specialty?" Observed variables include occupation, gender, parental status, percent female Soldiers led, percent pregnant Soldiers led, and main occupation of the unit assigned. Latent variables include socially desirable responding (SDR), sexism, and attitudes toward pregnancy stigma.

Figure S2 depicts the conceptual model for Aim 2, Question 2b, regarding leaders' perceptions of the impact of pregnancy on unit readiness. Perceived readiness impact was based on directly-reported scores from the single item on the ALPA assessing these attitudes.

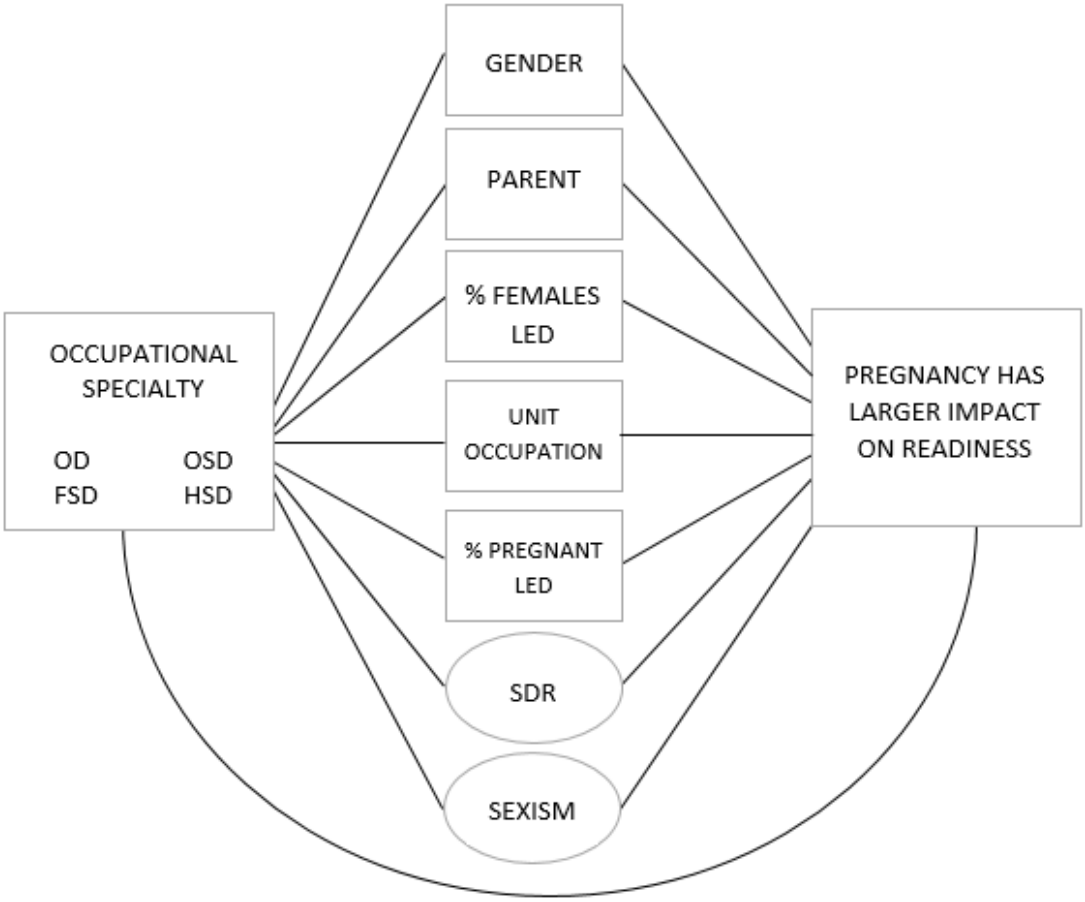

Figure S2. Conceptual Model of Aim 2, Question 2b, Readiness Impact. Conceptual model depicting the relationships tested in the research question, "Do leaders have differing levels of agreement with pregnancy stigma and views on the impact of pregnancy to readiness by occupational specialty?" Observed variables include occupation, gender, parental status, percent female Soldiers led, percent pregnant Soldiers led, main occupation of the unit assigned, and item score on perceived readiness impact. Latent variables include socially desirable responding (SDR) and sexism.

Figure S3 depicts the conceptual model for Aim 3, Question 3a, regarding leaders' familiarity with the Pregnancy and Postpartum Physical Training (P3T) Program. The purpose was to assess for group differences in P3T familiarity by occupational specialty. Familiarity level was a directly-reported variable on the ALPA, which was a five-level categorical variable. This variable was dummy-coded for analysis.

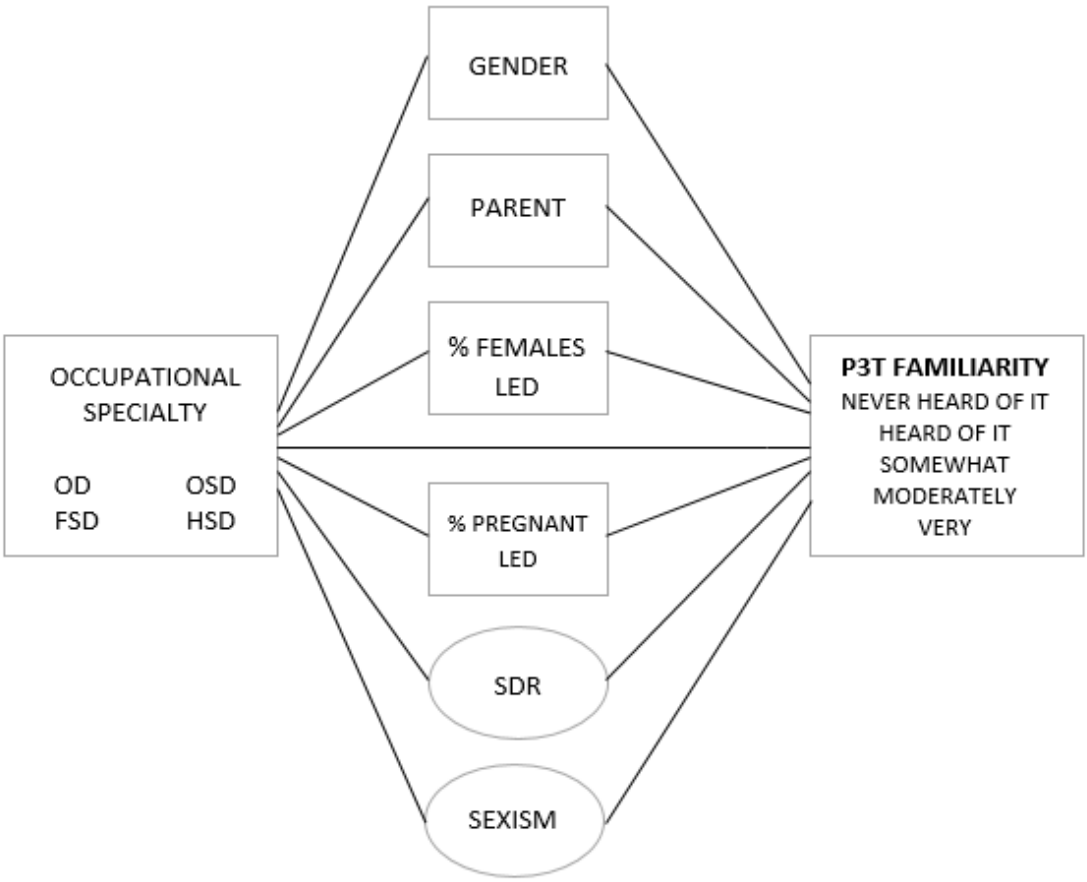

Figure S3. Conceptual Model of Aim 3, Question 3a, P3T Familiarity. Conceptual model depicting the relationships tested in the research question, "Does leaders' knowledge of P3T differ based on their occupational specialty?" Observed variables include occupation, gender, parental status, percent female Soldiers led, percent pregnant Soldiers led, and familiarity level. Latent variables include socially desirable responding (SDR) and sexism.

Figure S4 shows the conceptual model for Aim 3, Question 3b, regarding leaders' attitudes toward P3T implementation and outcomes. Both P3T implementation attitudes and the attitudes about P3T goal attainment (outcomes), were latent variables as measured by the component scores on the P3T Subscale.

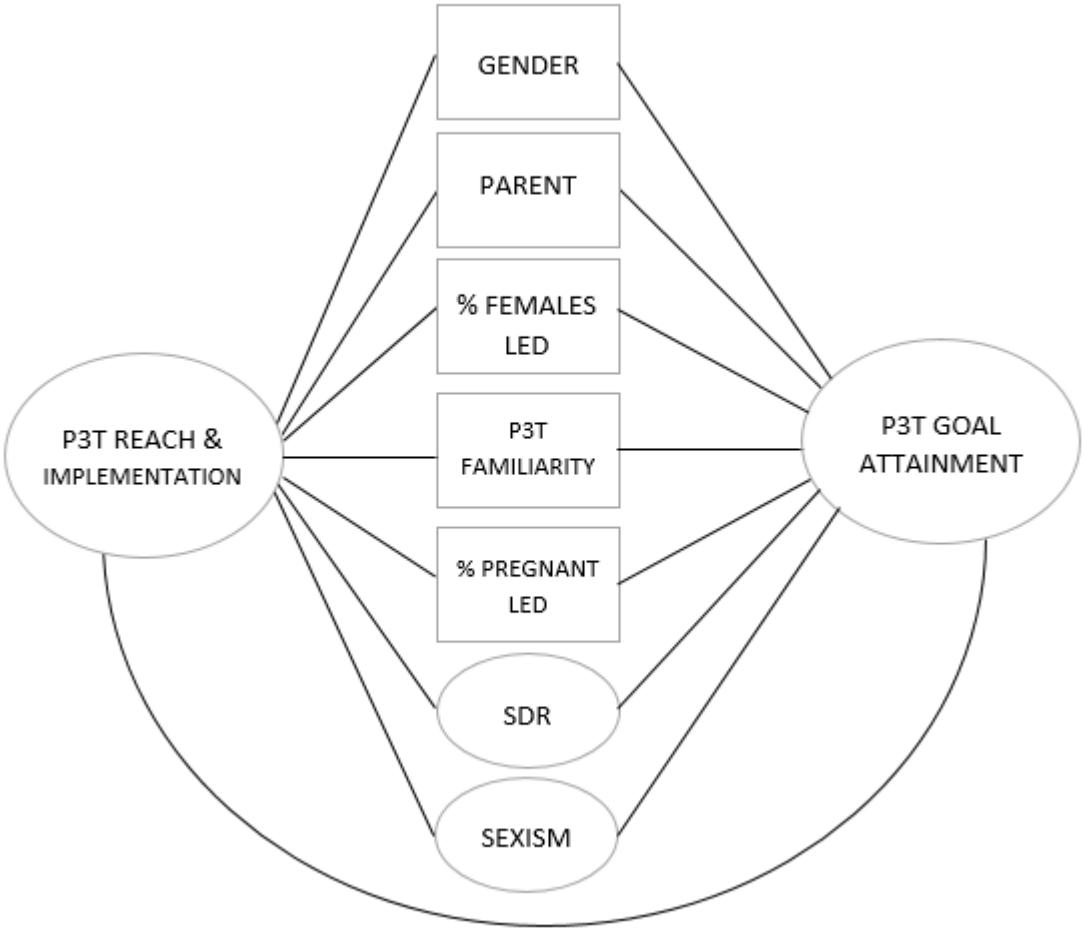

Figure S4. Conceptual Model of Aim 3, Question 3b, P3T Implementation and Outcomes.

Conceptual model depicting the relationships tested in the research question, "Is there a relationship between leaders' attitudes toward P3T implementation practices and their views on P3T outcomes?" Observed variables include gender, parental status, percent female Soldiers led, percent pregnant Soldiers led, and familiarity level. Latent variables include attitudes toward P3T reach and implementation, attitudes toward P3T goal attainment, socially desirable responding (SDR) and sexism.

Figure S5 shows the conceptual model for Aim 4, Question 4, regarding leaders' attitudes toward the adequacy of integration training. These attitudes are assessed based on the component score for Component 6 of the ALPA and are not directly observed.

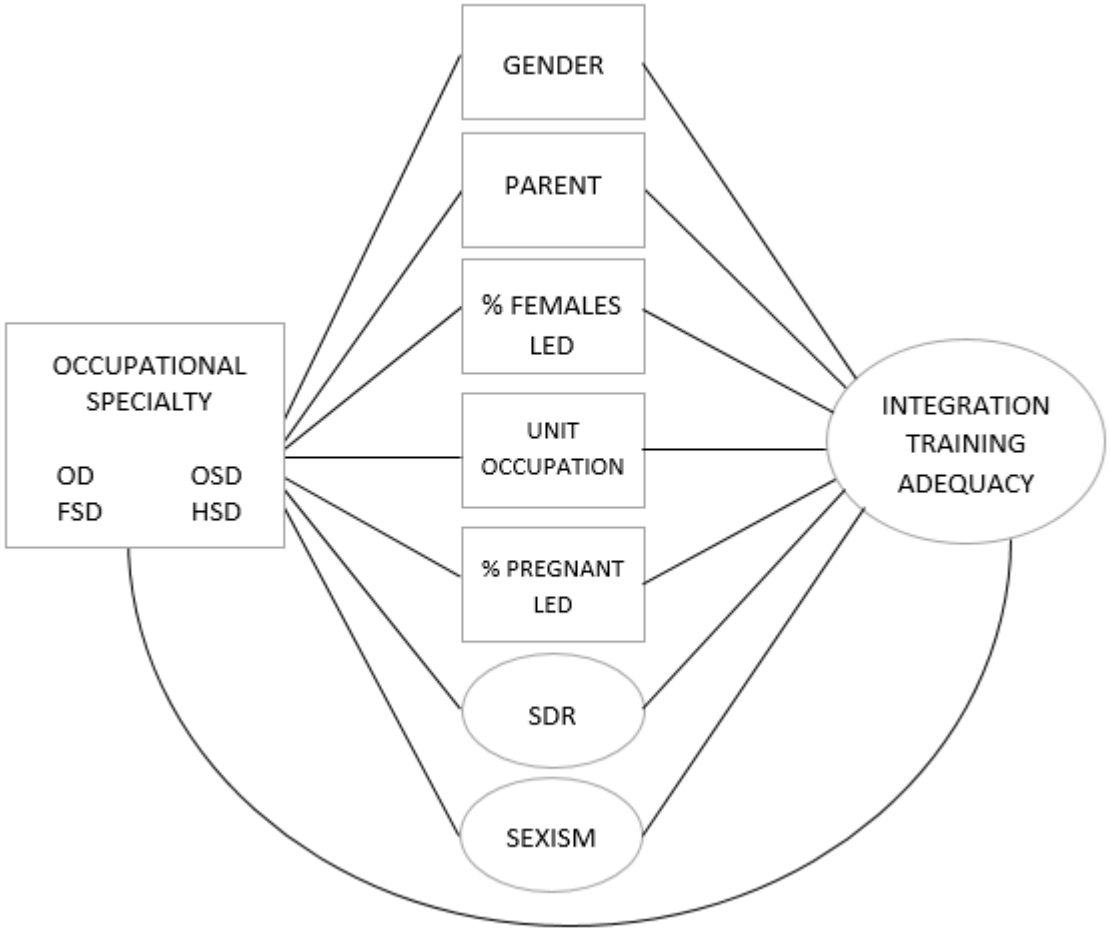

Figure S5. Conceptual Model of Aim 4, Question 4, Integration Training. Conceptual model depicting the relationships tested in the research question, "Are there occupational differences in leaders' perceived adequacy of the Army's training in preparing leaders to operate in mixed-gender units?" Observed variables include occupation, gender, parental status, percent female Soldiers led, percent pregnant Soldiers led, and main occupation of the unit assigned. Latent variables include socially desirable responding (SDR), sexism, and attitude toward integration training adequacy.

Figure S6 shows the conceptual model for the regression analysis of the single-item response to item 36, whether leaders felt comfortable leading both male and female Soldiers, stratified by occupational specialty. The item score itself was an observed variable from the ALPA.

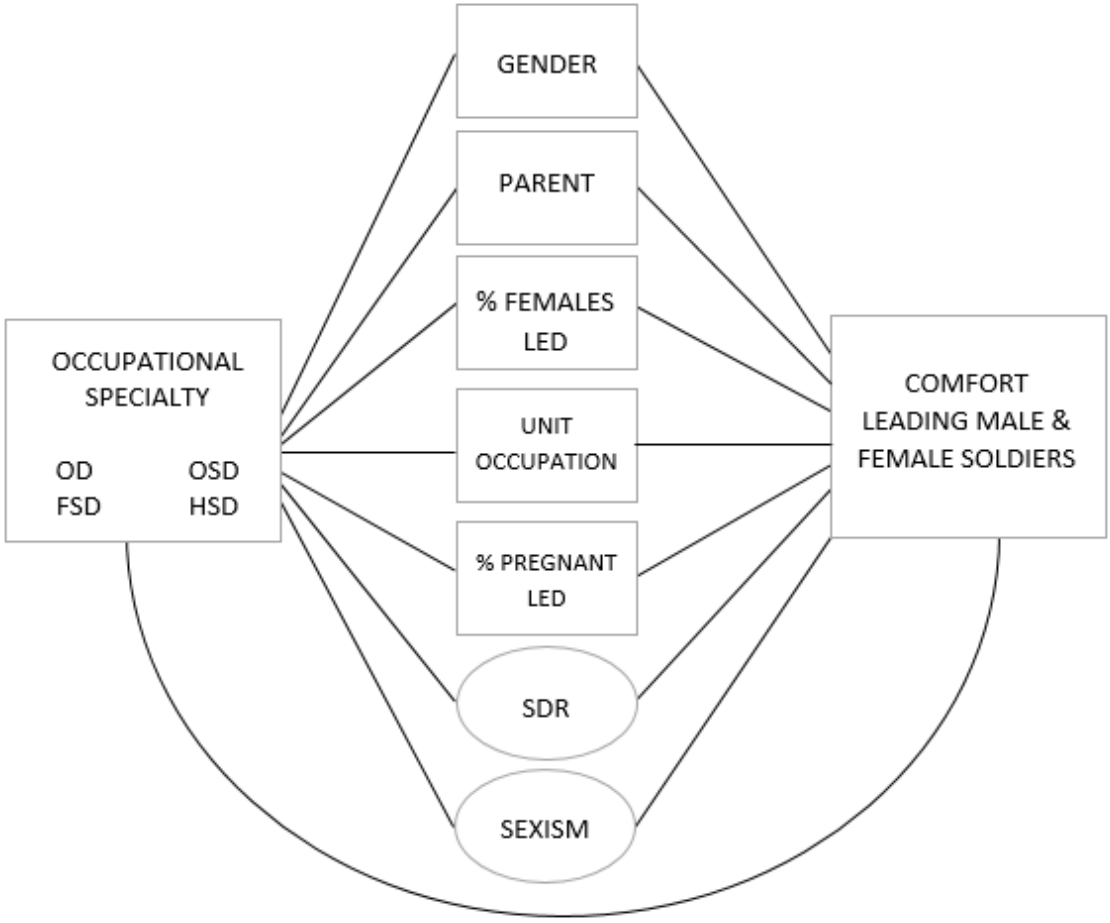

Figure S6. Conceptual Model of Aim 4, Question 4, Leadership Comfort. Conceptual model depicting the relationships tested in the research question, "Do leaders' attitudes toward integration differ based on their occupational specialty?" Observed variables include occupation, gender, parental status, percent female Soldiers led, percent pregnant Soldiers led, main occupation of the unit assigned, and item score on leaders' reported comfort leading male and female Soldiers. Sexism and SDR were latent variables derived from the sum of scores on the MSS and IMS, respectively.

Figure S7 depicts the flow diagram of participants included in this study. Individuals who were eligible came from a population of 561,730, and the sample size was approximately 0.1% of the eligible population. After cases were excluded, a sample of 423 participants was available. The number of cases included in analyses differed for several of the analyses. The minimum included was 207 for leader attitudes toward pregnancy, pregnancy stigma, and integration training adequacy due to insufficient data.

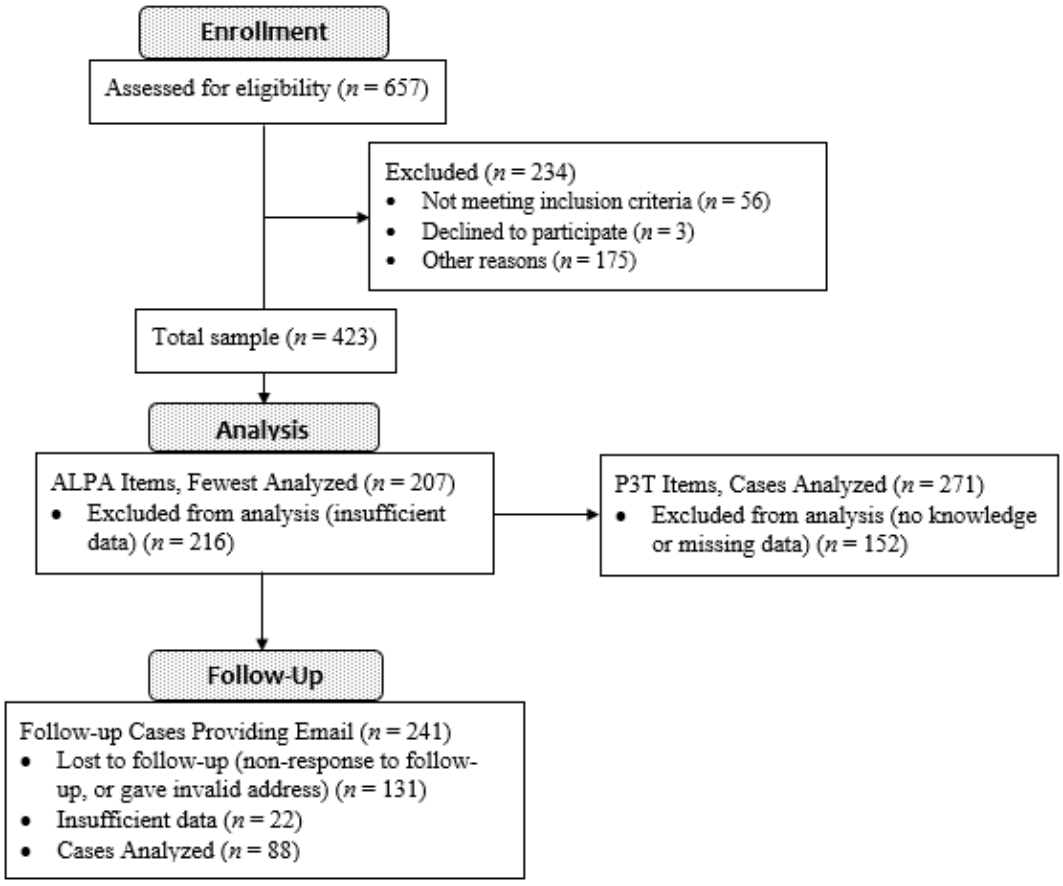

Figure S7. Participant Flow Diagram
Participants in the study were initially assessed for eligibility. Those who did not meet inclusion criteria or otherwise were unable to participate were excluded from analysis. Of the final sample, 207 participants were included in the analyses for leader attitudes toward pregnancy, pregnancy stigma, and integration training adequacy due to insufficient data. A total of 271 participants were included in the analyses for attitudes toward P3T Implementation and Outcomes.