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The Sexual Harassment of Female Active-Duty Personnel: Effects on Job Satisfaction and Intentions to Remain in the Military

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Abstract

This paper examines the relationship between sexual harassment and the job satisfaction and intended turnover of active-duty women in the U.S. military using unique data from a survey of the incidence of unwanted gender-related behavior conducted by the U.S. Department of Defense. Overall, 70.9 percent of active-duty women reported experiencing some type of sexually harassing behavior in the 12 months prior to the survey. Using single-equation probit models, we find that experiencing a sexually harassing behavior is associated with reduced job satisfaction and heightened intentions to leave the military. However, bivariate probit results indicate that failing to control for unobserved personality traits causes single-equation estimates of the effect of the sexually harassing behavior to be overstated. Similarly, including women's views about whether or not they have in fact been sexually harassed directly into the single equation model reduces the estimated effect of the sexually harassing behavior itself on job satisfaction by almost a half while virtually eliminating it for intentions to leave the military. Finally, women who view their experiences as sexual harassment suffer additional negative consequences over and above those associated with the behavior itself.

1. Introduction:

In 1995, approximately 195,000 women—13 percent of the total force—were on active duty in the U.S. military. This represents a six-fold increase since 1973 when the all-volunteer force was established (DoD, 1996). Intrinsic differences between military and civilian employment make sexual harassment a particularly complex issue for the U.S. military. As many as one in two women employed in the civilian workforce may experience sexual harassment at some point in their work lives and there is growing evidence that this imposes substantial costs on both workers and firms (Schneider, *et al.*, 1997).[1] Military personnel, however, often live on military bases and are on duty 24 hours per day. The blurring of professional and personal relationships which results from this high degree of proximity is likely to increase both the incidence and subsequent psychological costs of sexual harassment in military employment (DoD, 1996).

At the same time, a booming economy and a tight labor market made attracting and retaining high-quality personnel a challenge for the U.S. military throughout much of the 1990s. Concerns about military readiness and missed recruiting goals have resulted in Congress recently approving large increases in military pay (Hosek and Sharp, 2001). While relative compensation is clearly an important issue, the nature of military employment must also play a part in individuals' decisions to enter and remain in military employment. If sexual harassment results in men and women failing to enlist or once enlisted, choosing to end their military careers, the costs of sexual harassment for the U.S. military are likely to be substantial.[2]

[1] The U.S. Merit Systems Protection Board (USMSPB), for example, estimates that between 1992 and 1994 sexual harassment in Federal agencies cost the Federal Government $327 million (USMSPB, 1995). See Schneider, *et al.* (1997) and Fitzgerald, *et al.* (1997) for reviews of the literature regarding the incidence and consequences of sexual harassment in the workplace.

[2] The recruiting and retention of female personnel are likely to be especially problematic because women report a higher incidence of sexual harassment than do men (Antecol and Cobb-Clark, 2001). In addition, projections

Our objective is to examine the relationship between sexual harassment and the job satisfaction and intended turnover of active-duty women in the Armed Forces. We begin by incorporating measures of unwanted gender-related behaviors into single-equation models of the determinants of job satisfaction and intentions towards future military employment. This allows us to directly compare our results to those in the literature. This estimation strategy, however, implicitly assumes that reports of sexually harassing behaviors are exogenous which is unlikely to be the case. In particular, unobserved personality traits may influence reports of sexually harassing behaviors on the one hand and reported satisfaction with and intentions to remain in military employment on the other. We therefore adopt two alternative strategies for accounting for the role of unobserved characteristics. First, we specify a bivariate probit model that allows us to take into account any correlation between the error terms in the reports of sexually harassing behaviors and job satisfaction equations. Secondly, we incorporate women's views about whether they have in fact been sexually harassed directly into the model.

Overall, 70.9 percent of active-duty women reported experiencing some type of sexually harassing behavior in the 12 months prior to the survey. Using single-equation probit models, we find that experiencing a sexually harassing behavior is associated with reduced job satisfaction and heightened intentions to leave the military. However, failing to control for unobserved personality traits causes single-equation estimates of the effect of the sexually harassing behavior to be overstated. Bivariate probit results suggest that experiencing a sexually harassing behavior does not significantly increase dissatisfaction with military employment once the correlation in the unobserved factors associated with reporting a sexually harassing behavior and job satisfaction are taken into account. Similarly, directly controlling for women's views

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suggest that relative military-civilian pay will not rise as much for enlisted women as enlisted men due to the relatively higher wage growth for women in the civilian sector (Hosek and Sharp, 2001).

about whether they have been sexually harassed substantially reduces the estimated negative effect of the sexually harassing behavior itself on overall job satisfaction and suggests that there is no significant effect of sexually harassing behaviors on the intention to remain in military employment. At the same time, women who view their experiences as sexual harassment suffer additional negative consequences over and above those associated with the behavior itself. This is at odds with previous results that suggest that women exposed to sexually harassing behaviors report similar negative consequences whether or not they label their experiences as sexual harassment (Magley, *et al*., 1999).

In the next section we summarize the previous literature on the job satisfaction, intentions to quit and the role of sexual harassment. Section 3 provides the details of the data used in the analysis, while Section 4 examines the determinants of reported unwanted gender-related behaviors in military employment. Subsequently, the estimation results from the single-equation models are discussed. The potential endogeneity of reported sexual harassment is examined in Section 6, while our conclusions and directions for future research are presented in Section 7.

2. Job Satisfaction, Intentions to Quit, and the Role of Sexual Harassment:

Although economists first considered the relevance of job satisfaction for economic models twenty five years ago (Hamermesh, 1977; Freeman, 1978), in the intervening years the study of job satisfaction has mainly remained the purview of psychologists and sociologists. Economists have had relatively little to say about job satisfaction. In large part this results from the ambivalence that economists feel toward analyzing subjective variables. In particular, Freeman (1978, p. 140) concluded that subjective variables like job satisfaction contain useful information for understanding behavior, but "they also lead to complexities due to their

dependency on psychological states." In recent years many authors have noted a surge of interest on the part of economists in studying subjective outcomes generally (Clark, 1996) and job satisfaction in particular (Heywood and Wei, 2001; Shields and Ward, 2000). The result has been a growing literature assessing the determinants of job satisfaction and to a lesser extent the implications of job satisfaction for other outcomes of interest.[3]

Studying the effect of sexual harassment on job satisfaction is of interest because job satisfaction is a measure of overall well-being (Clark, 1996 and 1997) as well as an important predictor of individual behavior. In particular, the psychology literature provides evidence that low job satisfaction is correlated with increased absenteeism (Clegg, 1983), lower worker productivity (Mangione and Quinn, 1975), and increased incidence of mental and physical health problems (Locke, 1976). More importantly for our purposes here, job satisfaction is also related to both intentions to quit (Laband and Lentz, 1998; Gordon and Denisi, 1995) and actual quit behavior (Freeman, 1978) with estimates derived from panel data demonstrating that the causality runs from job satisfaction to future quitting behavior.[4]

Of course any study of job satisfaction does rely on there being some commonly perceived notion of what it means to be "satisfied". While it is certainly not the case that all individuals would scale their satisfaction in the same way, systematic differences in reported levels of job satisfaction among different groups of workers do suggest that individuals' reported job satisfaction levels are not completely idiosyncratic (Clark, 1997).[5] Women and blacks report higher levels of job satisfaction even though on many objective measures their jobs are worse, a finding which is thought to result from the fact that these groups have lower expectations (Bartel,

[3] For extensive reviews of the empirical job satisfaction literature see Clark, (1996); Clark and Oswald, (1996); Heywood and Wei, (2001); and Shields and Ward, (2000).

[4] See Shields and Ward (2000) for a review of the literature assessing the relationship between job satisfaction on the one hand and quits and intentions to quit on the other.

1981; Clark, 1997). Job satisfaction is also systematically related to both worker characteristics (such as age) and job characteristics (such as union status, establishment size, and self-employment status).[6]

In spite of the growing job satisfaction literature, few studies have explicitly examined the effect of sexual harassment on job satisfaction and intended turnover of female employees.[7] One exception is the work of Laband and Lentz (1998) that finds that female lawyers in the United States are more likely to be dissatisfied with their job and more likely to report the intention to leave their job if they also report experiencing sexual harassment.[8] To the extent that these patterns hold also for female military personnel, any widespread pattern of sexual harassment would be at odds with the military's efforts to achieve recruiting goals and to retain trained military personnel. Laband and Lentz, however, did not explicitly address the potential endogeneity of reported sexual harassment leaving open the question of what role unobserved characteristics might play in driving the results.

3. Data

This paper examines the relationship between sexual harassment and the job satisfaction and intended turnover of active-duty women in the U.S. Armed Forces using data from the 1995 Status of the Armed Forces Surveys: Form B—Gender Issues conducted by the U.S. Department of Defense (DoD). The data generalize to men and women in the Army, Navy, Marine Corps, Air Force, and Coast Guard with at least six months of active-duty service who were not flag

[5] Clark (1997) also points to the fact that psychologists and sociologists have repeatedly validated job satisfaction measures as evidence that it is useful to analyze job satisfaction.
[6] See Shields and Ward (2000) and Heywood and Wei (2001).
[7] See Fitzgerald, *et al*. (1997) for references to the psychology literature on the effects of sexual harassment on job satisfaction.

rank officers. Non-proportional, stratified random sampling was used to ensure that there were adequate numbers of women and minorities available for analysis. Questionnaires were mailed to sample members between February and September of 1995. From an initial sample of 49,003 individuals, usable questionnaires were returned from 22,372 women and 5,924 men for an overall response rate of 58 percent (DoD, 1996; Hay and Elig, 1999). Although the data generalize to all active-duty personnel, we focus here on a final sample of 19,467 active-duty women with non-missing values for all of the variables of interest.

Women in the sample were asked which of 24 separate unwanted gender-related behaviors they had experienced in the previous 12 months. These behaviors ranged from being subjected to offensive sexist remarks and being told sex jokes to experiencing unwanted physical contact and sex without consent. Responses to the 24 separate items in Form B are generally combined into five broad categories: 1) sexist behavior, 2) crude or offensive behavior, 3) unwanted sexual attention, 4) sexual coercion, and 5) sexual assault.[9] Given that our interest is in sexual harassment, we confine our attention to the middle three categories and define four types of sexually harassing behavior: 1) crude or offensive behavior, 2) unwanted sexual attention, 3) sexual coercion, and 4) any of the above.[10] It is important to note that these definitions of "sexual harassment" do not necessarily fit with legal definitions.

Table 1 provides a detailed list of the specific behaviors that make up each type of unwanted gender-related behavior. Overall, 70.9 percent of active-duty women reported

[8] In related work Shields and Price (2001) use single-equation models to examine the effect of racial harassment on job satisfaction and intentions to remain in the British nursing profession. They find that job dissatisfaction and intentions to quit increase with racial harassment.

[9] The questions included in Form B were based on a survey instrument—The Sexual Experiences Questionnaire (SEQ)—developed by psychologists at the University of Illinois (Lancaster, 1999). Fitzgerald, *et al*. (1999) provide information about the validity and reliability of the survey instrument and discuss options for scoring responses to the individual behaviors.

experiencing some type of sexually harassing behavior. This incidence of experiencing sexual harassment among women in military employment appears high relative to the rates reported in the civilian workforce, though differences in survey design and the exact behaviors considered to be sexual harassment make direct comparisons difficult. Most importantly, the time frame differs. Whereas the DoD data reflect experiences over the previous 12 months, most surveys of civilian workers ask about the previous two years. In 1994, 44 percent of women employed by the U.S. Federal Government reported experiencing unwanted sexual attention at some point in the previous 24 months (USMSPB, 1995). Other estimates indicate that 68 percent of women employed at a large private-sector organization in the northwest and 63 percent of women employed in a mid-western university experienced sexual harassment over a two-year period (Schneider, *et al*., 1997). Similarly, 65.7 percent of female lawyers in private practice and 45.5 percent of female lawyers employed in a corporation or public agency reported experiencing sexual harassment in the two years prior to the survey (Laband and Lentz, 1998).

Table 1 Here

Crude or offensive behavior is the most frequently reported form of unwanted gender-related behavior among female active-duty personnel (69.2 percent), with unwanted sexual attention (40.8 percent), and sexual coercion (12.3 percent) occurring less frequently. One in two women (49.0 percent) said that in the past year they had often been told jokes about sex. In addition, almost 40 percent of female active-duty personnel reported that they had been whistled or stared at in a sexual way, experienced unwelcome sex discussions, or had been subjected to sexual remarks. Furthermore, approximately one in four active-duty women reported that they had repeatedly been asked for dates after declining or touched in a way that made them feel

[10] Sexist behavior includes, for example, being treated differently or put down because of one's sex, while sexual assault includes rape and attempted rape. As such, neither category would usually be considered sexual harassment

uncomfortable. Finally, 7.6 percent of active-duty women said that it had been implied that they would be rewarded if they had sex while 7.0 percent responded that they had been badly treated because they had refused to have sex with someone.[11,12]

In addition to asking active-duty personnel about the incidence and nature of unwanted gender-related behavior in the military, the DoD survey also collected information about how satisfied individuals were with certain aspects of military life.[13] Specifically, individuals were asked the following questions. First, how satisfied are you with your job as a whole? Second, suppose that six months from now you will be faced with the decision about whether to remain in military service. Assuming that you could remain, how likely is it that you would choose to remain in the military?[14] We consider two alternative discrete measures of job satisfaction. "(Very) dissatisfied" equals one for individuals reporting that they are either dissatisfied or very dissatisfied with their job as a whole and zero otherwise. "(Very) satisfied" equals one only for those women reporting that they are either satisfied or very satisfied with their jobs. Similar measures are defined for intentions to remain in military employment.

Table 1 (row 1) suggests that in general satisfaction with military employment is high with 62.6 percent of women on active duty reporting that they are (very) satisfied with their jobs.

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per se.

[11] Not surprisingly, there are large gender differences in the incidence of sexual harassment, with reports of sexual harassing behaviors much more common among women than among men (Antecol and Cobb-Clark, 2001). While almost three-quarters of women on active duty reported experiencing some form of sexual harassment, only one third of male active-duty personnel said that they had experienced any sexually harassing behaviors in the previous 12 months. Women were two times more likely than men to report crude/offensive behavior and more than five times as likely to report experiencing unwanted sexual attention or sexual coercion.

[12] Despite higher reports among female active-duty personnel, male and female reports of sexual harassment by service type (90 different sexual harassment contexts) are positively correlated (0.8260) at less than the 1 percent level (0.000). This is consistent with the results presented in Laband and Lentz (1998) who find a positive correlation of 0.9126 (0.000) between male reports of observed sexual harassment against women and women's reports of sexual harassment by job setting (30 different sexual harassment contexts). They argue that this positive correlation suggests that female reports coincide with "actual" sexual harassment.

[13] The DoD survey also has details on demographic, human capital, job, work group, and duty station characteristics.

[14] Possible responses to the first question include: very dissatisfied, dissatisfied, neither, satisfied, and very satisfied. Possible responses to the second question are: very unlikely, unlikely, neither, likely, and very likely.

Furthermore, 57.9 percent report that they are (very) likely to remain in the military. Not surprisingly, however, female active-duty personnel are much less likely to report being (very) dissatisfied or (very) unlikely to remain in the military if they did not experience sexually harassing behaviors. Furthermore, the incidence of job dissatisfaction and likelihood to leave the military are highest among female active-duty personnel who experience sexual coercion, with crude or offensive behavior having the least effect.

4. The Determinants of Sexually Harassing Behaviors

Who reports experiencing unwanted gender-related behaviors? How do the determinants of reports of sexually harassing behaviors differ by type of behavior? To consider this, we model the propensity to report sexually harassing behaviors (H^*) as:

$$H_{ij}^* = X_i\beta + \varepsilon_i \tag{1}$$

where $\varepsilon \sim N(0,1)$, i indexes individuals, and j indexes three discrete measures of reported sexual harassment. The first ("any sexually harassing behavior") equals one when a women reports any sexually harassing behavior including crude/offensive behavior, unwanted sexual attention, or sexual coercion, and equals zero otherwise. The second ("sexual attention/coercion") equals one if a woman reported that she experienced either unwanted sexual attention or sexual coercion. The third measure, "sexual coercion", equals one only for those women reporting some form of sexual coercion. These measures account for the differing degrees of severity of sexual harassment evident in Table 1.[15]

Our model includes a vector (X_i) of demographic characteristics (marital status, race) and human capital characteristics (education, years of active duty) thought to be related to the

[15] Magley, *et al*. (1999) note that because incidents of sexual harassment are not independent random events, the severity of sexual harassment may also serve as a proxy for the frequency of sexual harassment.

propensity to report sexual harassment. In addition, X_i includes current job characteristics (branch of service, pay level) along with indicators for whether or not a respondent is currently a supervisor, serving aboard a ship, located in the United States, and on a training-related assignment. Because male-dominated workplaces are associated with high levels of sexual harassment (USMSPB, 1995; Fitzgerald, *et al.*, 1997), X_i also includes an indicator of the gender of a woman's supervisor as well as measures of the gender composition of the military occupation and duty station in which she is employed.[16]

Finally, organizational factors may also facilitate or inhibit the occurrence of sexual harassment (Williams, *et al.*, 1999). Given this we have included in equation (1) variables capturing a respondent's sexual-harassment-related training during the past twelve months as well as the existence of an established office to investigate sexual harassment complaints, publicized formal complaint channels, and a sexual harassment hotline at the duty station.[17] The probability that a woman reports a sexually harassing behavior (H) is given by

$$\Pr(H_{ij} = 1) = \Pr(X_i\beta + \varepsilon_i > 0) = \Phi(X_i\beta) \tag{2}$$

where Φ is the standard normal cumulative density function.

Table 2 reports the estimated determinants of "sexual attention/coercion", "sexual coercion", and "any sexually harassing behavior". For ease of interpretation, we report the marginal effects (evaluated at means) and standard errors (calculated using the "delta" method).[18] Our results indicate that being married significantly decreases the probability of experiencing all types of sexually harassing behaviors. For example, married female active-duty

[16] In particular, respondents indicated whether their work groups were male-dominated, female-dominated or of equal gender mix (the omitted category). Respondents also were asked to indicate whether or not they were in a current military occupation specialty that is not usually held by persons of their gender.
[17] The sexual harassment training measure is a dummy variable that is coded as 1 if the individual received more than one hour of sexual harassment training and 0 otherwise.
[18] All estimation was performed in STATA 7.0. Coefficient estimates are available from the authors upon request.

personnel are 8.3 percentage points less likely to report any sexually harassing behavior, and 14.5 percentage points less likely to report sexual attention/coercion than are their single counterparts. Interestingly, relative to whites, blacks are significantly more likely to report sexual coercion, though they are less likely to report experiencing unwanted gender-related behaviors generally. There are no significant differences in the reports of sexually harassing behaviors by Hispanics and whites, though individuals identifying their race as "other" have a higher probability of reporting sexual attention/coercion and sexual coercion.

Table 2 Here

Furthermore, with the exception of sexual coercion, the incidence of unwanted gender-related behaviors significantly decreases with years of duty at an increasing rate. Reports of any sexually harassing behavior significantly increase with education, however.[19] For example, female active-duty personnel who have some college education (but less than a B.A.) are 7.8 percentage points more likely to report any sexually harassing behavior.[20] This is consistent with the previous research that suggests that among civilian Federal Government employees the typical victim of sexual harassment is college educated (See USMSPB, 1995).

The incidence of unwanted gender-related behaviors is significantly lower among all services relative to the Army, with the exception of Marines who report similar rates of sexual harassment generally and sexual attention/coercion in particular. For instance, female active-duty personnel in the Coast Guard are 8.7 percentage points less likely to report any sexually harassing behavior and 5.2 percentage points less likely to report sexual coercion than female active-duty personnel in the Army. Given that the overall incidence of sexual coercion in the

[19] The omitted education category is those with no college education.
[20] Interestingly, female active-duty personnel who have a Bachelors degree or greater than a Bachelors degree are 1.4 and 2.1 percentage points, respectively, less likely to report sexual coercion than female active-duty personnel

sample is 12.3 percent (see Table 1), this constitutes a very large difference in the relative probabilities of reporting sexual coercion. Personnel at the very bottom of the pay scale are also more likely to report sexual attention/coercion (20.3 percentage points) than are women at the top of the pay scale. Once women move beyond the first three or four rungs of the pay ladder there is little difference in their probability of reporting sexually harassing behaviors.

Unwanted gender-related behaviors are related to the nature of ones current job assignment. In particular, reports of sexually harassing behaviors are slightly lower among women on active-duty in the United States than among those stationed overseas. These differences are relatively minor, however, suggesting that the variation in institutions, policies, and social norms reflected in postings overseas have little effect on reports of sexually harassing behavior. Furthermore, individuals who are currently involved in supervising others or who are currently serving on a ship are significantly more likely to report experiencing sexually harassing behaviors. For instance, female active-duty personnel currently serving on a ship are 11.7 percentage points more likely than other women to report any sexual harassment and are 2.8 percentage points more likely to report sexual coercion. These results may not be particularly surprising given the close quarters that would typically define this type of duty.

Consistent with previous evidence (USMSPB, 1995; Fitzgerald, *et al.*, 1997), women working in male-dominated work groups are 6.4, 3.3, and 2.5 percentage points more likely to report experiencing any sexually harassing behavior, sexual attention/coercion, and sexual coercion, respectively. While previous researchers have only considered the dichotomous distinction between male-dominated and female-dominated workplaces, we find that women employed in female-dominated work groups are also more likely (2.4 percentage points) to

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with no college education. In contrast, with the exception of some college, education has little effect on sexual attention/coercion.

report sexual coercion than those employed in groups with equal gender mixes. Thus it appears that women employed in the U.S. military may experience more (or may be more likely to report) unwanted gender-related behaviors in work groups that have unequal gender mixes.

Finally, our results also indicate that having at least one hour of training on topics that relate to sexual harassment significantly decreases the probability of reporting sexually harassing behaviors. For instance, women who had had at least one hour of sexual harassment training are 3.8 percentage points less likely to report experiencing any sexually harassing behavior and 2.5 percentage points less likely to report sexual attention/coercion than women having no sexual harassment training. Women serving at duty stations with sexual harassment hotlines, offices devoted to the recording and investigating reports of sexual harassment, or publicized formal complaint channels are in general less likely to report experiencing sexual harassment. Thus, consistent with previous research, sexual harassment appears to be related to the extent to which the organization is successful in creating a climate in which sexual harassment is not tolerated (Williams, *et al.*, 1999).

5. Single Equation Estimates of the Effect of Sexually Harassing Behaviors on Job Satisfaction and Likelihood of Remaining in the Military

We begin by assuming that reports of unwanted gender-related behaviors are exogenous to job satisfaction and intentions of remaining in the military. This assumption will be considered further below. Suppose D_i^* measures a propensity to report being (dis)satisfied with military employment and (un)likely to remain in the military.

$$D_{ik}^* = Z_i\gamma + H_i\delta + \eta_i \tag{3}$$

where $\eta_i \sim N(0,1)$, k indexes the four discrete (0/1) outcome measures. Specifically, $D_{i1}=1$ for women reporting being dissatisfied or very dissatisfied with their job; $D_{i2}=1$ for women reporting being satisfied or very satisfied with their job; $D_{i3}=1$ for women reporting being unlikely or very unlikely to remain in the military; and $D_{i4}=1$ for women reporting being likely or very likely to remain in the military. In addition, Z_i is a vector of variables related to job satisfaction and intentions to remain in the military (see the notes to Table 3 for a list of the variables included in Z_i) and H_j are the various measures of sexually harassing behaviors discussed in Section 4. The probability that an individual reports being (dis)satisfied with or (un)likely to remain in military employment is then given by

$$\Pr(D_{ik}=1) = \Pr(Z_i\gamma + H_i\delta + \eta_i > 0) = \Phi(Z_i\gamma + H_i\delta). \quad (4)$$

The estimated marginal effect of sexually harassing behaviors on overall job dissatisfaction and intentions to leave the military —and the associated standard errors and p-values—are reported in Table 3.[21] Irrespective of the measure of unwanted gender-related behavior considered, experiencing a sexually harassing behavior significantly increases dissatisfaction with military employment and heightens intentions to leave the military. Similarly, experiencing a sexually harassing behavior significantly decreases satisfaction with military employment and lowers intentions to remain in the military.[22] Interestingly, sexually harassing behaviors have a larger effect on job (dis)satisfaction than on the intentions to remain or leave the military. For example, female active-duty personnel are 5.3 percentage points more likely to report they are (very) dissatisfied and 8.6 percentage points less likely to report they are

[21] Marginal effects for the complete model are available from the authors upon request.

[22] Given that our results from the job dissatisfaction and job satisfaction equations and the unlikely to remain and likely to remain in the military equations are of opposite sign—leading us to the same substantive conclusions—it

(very) satisfied with their job if they experienced any sexually harassing behavior. At the same time, any sexually harassing behavior increases the probability of reporting being (very) likely to leave military employment by 1.8 percentage points, and reducing the probability of being (very) likely to remain by 3.3 percentage points.

Table 3 Here

Not surprisingly, sexual coercion has the biggest effect on both overall satisfaction with and intentions toward remaining in military employment. Women on active-duty in the U.S. military are 7.9 percentage points more likely to report they are (very) dissatisfied with their job and 12.5 percentage points less likely to report they are (very) satisfied with their job if they experienced sexual coercion. Sexual coercion also has a relatively large effect on intentions toward remaining/leaving military employment.

These findings for women on active duty in the U.S. military are broadly consistent with the previous results for women working in the civilian labor market (see for example, Laband and Lentz, 1998 and Fitzgerald, *et al.,* 1997).[23] Laband and Lentz (1998), for example, report that female lawyers are 16.8 (14.0) percentage points more likely to report being dissatisfied with their job and 8.0 (11.8) percentage points less likely to report being satisfied with their job if they experienced sexual harassment by their superiors (colleagues). Controlling for job satisfaction, Laband and Lentz also find that female lawyers are 26.6 (27.5) percentage points more likely to report unlikely to remain in their job if they experienced sexual harassment by their superiors (colleagues). Interestingly, sexual harassment by clients does not appear to affect overall job satisfaction or intentions to quit. Comparing these results to those in Table 3 indicates that

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does not appear to matter how the middle category of responses is treated. In addition, we also estimated ordered probit models and found similar results. The ordered probit results are available from the authors upon request.

[23] See Fitzgerald, *et al*. (1997) for a review of some of the psychology research on the effects of sexual harassment on job satisfaction, job performance, employee health and psychological well-being. Interestingly, Shields and Price

unwanted gender-related behaviors have a more detrimental effect on job satisfaction and intentions to remain in the job in the legal profession than in the military.

6. The Role of Personality Traits: Accounting for Omitted Variable Bias

The single-equation models discussed in Section 5 suggest that experiencing sexually harassing behaviors leads to reduced job satisfaction and an increased probability of leaving the military. These estimates (like the previous results in the literature) assume that reports of sexually harassing behaviors are exogenous to reports of job satisfaction and intentions towards future military employment. However, it is unlikely that this is the case. Heterogeneity in individuals' perceptions of, tolerance towards, or willingness to report unpleasant events in the workplace is likely to affect both reports of sexually harassing behaviors and women's satisfaction with military employment. Taking this into account would affect the estimated effect of sexually harassing behaviors *per se.*

To see this, consider the following. Suppose rather than equations 1 and 3, the true model is given by the following:

$$\begin{aligned} H_i^* &= X_i\beta + A_i\alpha + \varepsilon_i' \\ D_{ij}^* &= Z_i\gamma + H_i\delta + A_i\varphi + \eta_i' \end{aligned} \tag{5}$$

where A_i is some measure of an individual's "personality", "disposition", or "willingness to report" and the other variables are defined as before. Of course A_i is unobserved, and the question then becomes how might $\hat{\delta}$ presented in Table 3 be biased by our failure to control for this in the estimation procedure? The answer to this question depends on the following:

(2001) find that racial harassment results in reduced job satisfaction and increased intentions to quit among British nurses employed by the National Health Service.

$$E(\hat{\delta}) = \delta + \frac{Cov(H_i, A_i)}{Var(H_i)} \cdot \varphi \tag{6}$$

If a positive disposition or a high degree of tolerance for negative job situations reduces both the propensity to both report sexually harassing behavior and being dissatisfied with military employment, then the single-equation estimates of the effect of sexually harassing behaviors on the probability of being dissatisfied (see Table 3) are overstated.

Two strategies are utilized to deal with this problem. First, we specify a bivariate probit model that allows us to take into account any correlation between the error terms in the sexual harassment and job satisfaction equations. This approach has the advantage that we do not have to be specific about what characteristics are being omitted, but suffers from the disadvantage that the resulting estimates are identified off of potentially weak exclusion restrictions. The second approach involves the inclusion of a proxy for the omitted characteristic directly into the model. This eliminates the need to find sensible exclusion restrictions, but allows us to consider only a more restricted notion of what A_i is, leaving open the possibility that there continue to be other unobserved elements of "personality" or "disposition" that are not being taken into account.

A. A Bivariate Probit Model:

Omitting A_i from the above model opens up the possibility of omitted variable bias in our estimation of equation (4) because $Cov(H_{ij}, \eta_i) \neq 0$. One solution is to re-estimate equations (2) and (4) using a bivariate probit model which allows us to directly account for the possibility that the unobserved determinants of job satisfaction and reported sexual harassment are

correlated.[24,25] In order for the model to be identified, X_i must contain at least one extra variable that is not contained in Z_i. Bivariate probit models are sensitive to the choice of exclusion restrictions[26], however, and this raises the question of whether we can sensibly exclude certain variables from equation (4). We begin by investigating this issue.

Investigating the Validity and Power of Our Instruments:

Based on the results in Tables 1 and 2 and the previous literature, we considered two alternative exclusion restrictions including whether or not the respondent is currently serving on a ship and marital status. Investigation of both the validity and power of our instruments lead us to conclude that we do not have valid instruments that are powerful enough to detect the effect of sexually harassing behaviors on the intention to remain in the military. Thus, we focus our attention on estimating the bivariate probit model only for the job satisfaction equation.

In order to be valid our instruments must be first, related to the probability of reporting sexually harassing behaviors and second, unrelated to job satisfaction/dissatisfaction with military employment. Demonstrating the first proposition is straightforward. In our single-equation probit model of the determinants of sexual harassing behaviors (see Table 2) both marital status and current ship status are, in general, individually significant at the one percent

[24] See Evans and Schwab (1995) for an example of the use of a bivariate probit model to estimate the returns to Catholic education.
[25] The triangular nature of the model implies that the simultaneity can be ignored and the model is consistently estimated using a seemingly unrelated regressions model such as the bivariate probit.
[26] For a discussion of the sensitivity of bivariate probit models to the choice of exclusion restrictions, see for example, Manski *et al*., (1992) or Painter and Levine, (2000).

level irrespective of the type of behavior considered.[27] In all cases, the instruments are jointly significant at less than the one percent level.[28]

The next question becomes: can these instruments legitimately be excluded from the model of job satisfaction? While we see no compelling theoretical argument for including these variables in our model of job satisfaction, there is also no compelling theoretical reason for excluding them and so the matter is largely an empirical issue. To explore this we first re-estimated equation (3) including marital status and ship status in the overall job satisfaction/dissatisfaction equations. Though not a formal test, this does provide an indication of the patterns in the underlying data (see Evans and Schwab, 1995). In all cases, the proposed instruments were neither individually nor jointly significant at the ten percent level.

Overidentification tests can also be used to evaluate whether the proposed instruments can sensibly be excluded from the job satisfaction equations. In practice 2SLS estimates are very close to the marginal effects ("average treatment effects") generated by a bivariate probit model (Angrist, 1991). Given this, we follow Evans and Schwab (1995) in adopting a chi-squared overidentification test first proposed by Hausman (1983).[29] The resulting test statistics were less than 0.15, strongly supporting our exclusion restrictions.[30]

We then turned to consider whether our instruments were in fact powerful enough to detect an effect of sexual harassment on job dissatisfaction. Evans, *et al.* (1999) present a procedure for calculating the percentage-point change in the probability of observing a positive outcome that a discrete instrument must generate in order to detect a statistically significant

[27] The exception is that current ship status is significant at only five percent in the sexual coercion equation.
[28] Finite sample bias does not appear to be a concern in our model (see Bound *et al*., 1995). The F-statistics for the instruments from an OLS regression of the first-stage equation are 92.12 (p=0.000), 218.69 (p=0.000), and 70.85 (p=0.000) for our three measures of sexually harassing behaviors, respectively.
[29] Although this procedure does not result in a proper formal test of the exclusion restrictions given the discrete nature of our dependent variables, it does represent the best available diagnostic (Evans and Schwab, 1995).
[30] The 95 percent critical values for the chi-squared distribution is 5.99 (d.f.=2).

2SLS coefficient of a certain magnitude. Although again not a proper formal test of the power of the instruments in a bivariate probit model, this calculation sheds light on this issue because of the correspondence in 2SLS and bivariate probit estimates.[31]

To illustrate let us first consider the effect of "any sexual harassment" on the probability of being dissatisfied or very dissatisfied with military employment. Given our sample size, we calculate that marital status must generate at least a 19.7 percentage point change in the probability of reporting one or more sexually harassing behaviors in order for us to detect an effect of sexual harassment on job dissatisfaction of the magnitude (0.053) reported in Table 3 at the five percent level. Our data indicate, however, that the proportion of married women reporting some form of sexual harassment is 62.9 percent compared to 73.3 percent of unmarried women, a difference of 10.4 percentage points. Thus, if the effect of any form of sexual harassment on the probability of being dissatisfied or very dissatisfied with military employment were 5.3 percentage points (as we estimated using a standard probit model) we would not be able to detect it in a 2SLS model at the five percent level using marital status as our sole instrument. However, this calculation also reveals that we would be able to detect such an effect using marital status between the 20 and 30 percent significance level.

We repeated these calculations for each proposed instrument in the job (dis)satisfaction equations using all three definitions of sexually harassing behaviors. The significance levels at which we would begin to detect estimated effects of the same magnitude as those reported in Table 3 are given in the Appendix Table A1. These results indicate that marital status is a more powerful instrument than ship status in identifying the effects of sexual harassment on both job satisfaction and job dissatisfaction. In all cases marital status would be powerful enough on its

[31] The details of this calculation are presented in the Appendix. These calculations are conservative in the sense that they focus on the power of each instrument in isolation from the others.

own to detect an estimated effect with at least a 30 percent level of confidence. Ship status is an important predictor of all types of sexually harassing behaviors, but because very few women in the sample (3.6 percent) actually serve on a ship, it is not powerful enough on its own to act as a sensible instrument.[32] Based on these results, we conclude that current ship status and marital status serve as sensible exclusion restrictions in the bivariate probit model.

Estimation Results:

Selected marginal effects (and their associated standard errors and p-values) from the bivariate probit model are presented in columns 1 and 2 of Table 4, while the estimated correlation in the error terms in the two equations are presented in column 3.[33] The results suggest that experiencing a sexually harassing behavior does not significantly affect dissatisfaction with military employment once the correlation in the unobserved factors associated with reported sexual harassment and job satisfaction are taken into account. For comparison purposes we also estimated the effect of reported unwanted gender-related behaviors using a 2SLS model. These results (presented in columns 4 and 5 of Table 4) reinforce the conclusions drawn from the bivariate probit model. Thus, it appears that single-equation estimates of the effect of experiencing sexually harassing behaviors on job satisfaction—such as those reported in Table 3 and in the previous sexual harassment literature—are overstated due to omitted variable bias resulting from the failure to control for unobserved personality traits.

[32] When we repeated these calculations for the intentions to leave/remain in military employment we found that we did much worse at finding instruments for the probability of leaving and the probability of remaining in military employment equations first, because the estimated effect of sexual harassment on future intentions regarding military employment is smaller (see Table 3) requiring more powerful instruments and second, because marital status could not be excluded from this equation.

[33] The marginal effects were calculated for each individual and then averaged across the estimation sample. The standard errors were calculated using the "delta" method (see Deaton, 1998). The independent variables in the regression are defined as in Tables 2 and 3.

Note that the p-value for the estimated coefficient in the job satisfaction and job dissatisfaction equations lies between 0.234 and 0.946 which in each case is higher than the calculated power of our instruments reported in Appendix Table A1. So for example, we calculated that marital status would have been powerful enough on its own to detect the effect of sexual attention/coercion on job dissatisfaction between the 10 and 20 percent significance level. However, the p-value on this coefficient in the bivariate probit model is 0.235, while the p-value in the 2SLS model is 0.346. Thus, if the true effect of experiencing sexually harassing behaviors on job dissatisfaction had been as large as reported in Table 3, we would have been able to detect it given our exclusion restrictions. The insignificant relationships between sexually harassing behaviors and job (dis)satisfaction reported in Table 4 do not appear to be strictly due to weak instruments.

Table 4 Here

B. Directly Controlling for Personality Traits:

The above results imply that once we take into account unobserved heterogeneity in the propensity to report experiencing sexually harassing behaviors and being dissatisfied with military employment experiencing unwanted gender-related behaviors does not result in reduced job satisfaction. Can we say anything about which unobserved characteristics might matter? In an attempt to answer this question, we re-estimate our satisfaction with and intentions to remain in military employment equations adding a direct measure of whether women label their experiences as sexual harassment. While certainly not the only variable of interest, it seems sensible that women's perceptions of the behaviors they report experiencing are important to understanding the consequences of those experiences.

Women in our sample who report experiencing any form of sexually harassing behavior over the previous 12 months were also asked whether or not they considered any of the behaviors to in fact be sexual harassment. Not all female military personnel who report experiencing one or more of the 18 behaviors listed in Table 1 consider themselves to have been the victim of sexual harassment. Overall, 67.3 percent of women reporting any sexually harassing behavior consider themselves to have been sexually harassed. In contrast, 80.4 percent of women experiencing either sexual attention/coercion viewed this behavior as sexual harassment, while 91.6 percent of women experiencing sexual coercion labeled the behavior as sexual harassment. Though direct comparisons are difficult, women on active duty in the U.S. military appear to be less likely to label specific behaviors as sexual harassment than are their female counterparts in other agencies of the U.S. Government (USMSPB, 1995).

We use this additional information as a means of directly including a measure of unobserved "personality" or "disposition" in equation (4). This variable equals one for those respondents reporting that they experienced one or more sexually harassing behavior and considered that behavior to be sexual harassment. It is equal to zero for women who reported no specific incidents of sexually harassing behavior or for women who do report experiencing one or more of the 18 sexually harassing behaviors surveyed in our data, but indicate they have not been subject to sexual harassment. We then include this variable in our single-equation models of job satisfaction with and intentions to remain in military employment. This allows us to focus on two questions. First, conditional on the actual behavior a woman reports experiencing are there additional negative consequences from viewing that behavior as sexual harassment? Second, does controlling for women's views of sexual harassment affect our estimates of the effect of the behavior itself on job satisfaction and intentions toward future military

employment? These estimation results (marginal effects and standard errors) are presented in Table 5. While model 1 controls only for individuals' views about sexual harassment, models 2 – 4 control for actual behavior using our previous measures of unwanted gender-related behaviors as well as whether those behaviors were thought to be sexual harassment.

Table 5 Here

Believing that one has been sexually harassed is associated with lower job satisfaction and a heightened intention to leave the military (see model 1). These results are very similar to previous estimates of the effect of experiencing any form of sexually harassing behavior on job (dis)satisfaction and intentions to leave/remain in the military (see rows 1-4 Table 3). Controlling for type of sexually harassing behavior reduces the estimated effect somewhat. Still, it remains the case that women who see themselves as sexually harassed are significantly more likely to be dissatisfied with and intend to leave military employment than otherwise similar women who experience the same behavior, but do not consider it to be sexual harassment. After controlling for whether or not individuals report experiencing sexual attention/coercion, for example, we find that women who view this behavior as sexual harassment are 4.2 percentage points more likely to be (very) dissatisfied with their jobs and 1.8 percentage points more like to be (very) unlikely to remain in the military. These results are in sharp contrast to the previous literature that suggests that there is no difference in outcomes for those who label their experiences as sexual harassment and those who do not (Magley *et al*., 1999).

In addition, incorporating women's views directly into the model results in smaller estimated effects of the actual behaviors themselves on job satisfaction and intentions to leave the military. For example, female active-duty personnel experiencing any form of sexual harassing behavior are 5.3 percentage points more likely to be (very) dissatisfied with their

military jobs than women who experience no such behaviors (see Table 3). Once we control for whether or not they viewed this behavior as sexual harassment, this difference falls to 3.3 percentage points. In all cases, the estimated effect of sexually harassing behaviors falls in absolute value once we control for whether or not the respondent considered herself to be sexually harassed. In fact, the results presented in Table 5 suggest that there is only weak evidence that sexual harassing behaviors *per se* influence women's propensity to either leave or remain in the U.S. military. Women's views about whether they have experienced sexual harassment are more closely related to intentions towards future military employment.

In light of this, it is interesting to ask who considers herself to be sexually harassed? To answer this, we restrict our sample to those women reporting some form of sexually harassing behavior and use a probit model to estimate the determinants of whether or not she considered that behavior to be sexual harassment (see Table 6). Not surprisingly, female active-duty personnel are more likely to consider themselves to be sexually harassed if they experienced sexual attention/coercion than if they were subjected solely to crude and offensive behavior. More specifically, women experiencing sexual attention are 24.2 percentage points more likely to believe they were sexually harassed, while women experiencing sexual coercion are 44.0 percentage points more likely than other women to view their experiences as sexual harassment. Furthermore, female active-duty personnel are more likely to consider themselves to be sexually harassed if they are in a work group where the gender mix is not equal. Relative to the army, women in all other service types are less likely to consider themselves to be sexually harassed. For instance, female active-duty personnel in the Airforce are 7.7 percentage points less likely to consider themselves to be harassed than women in the Army**.**

Table 6 Here

Interestingly, women undergoing at least one hour of sexual harassment training are less likely to report experiencing sexually harassing behavior (see Table 2) and given that they do experience one or more sexually harassing behavior, are less likely to believe that they have in fact been sexually harassed. This raises the possibility that training itself may reduce the incidence of unwanted gender-related behavior, while at the same time mitigating the negative consequences of that behavior by altering women's perceptions. Still, there is little direct evidence in the literature that preventative measures like sexual harassment training serve to alter individuals' behavior. Although, all agencies within the U.S. Federal Government—including the U.S. military—provide training in preventing, recognizing, and handling sexual harassment no formal evaluation of these programs has taken place. Survey results from civilian employees indicate that workers participating in sexual harassment training find it to be a positive experience, but not overwhelmingly so. While 65 percent report that the training made them more sensitive to the issue of sexual harassment, fully one in five indicated that it had no effect on their attitudes or beliefs at all (USMSPB, 1995). Perhaps more important in reducing the incidence of sexual harassment might be the focus on proactive measures to avoid and deal with sexual harassment which are important components of the sexual harassment training provided to military personnel (U.S. Army, 2001).

7. Conclusions:

The tight labor market generated by the booming U.S. economy has made attracting and retaining high-quality personnel particularly challenging for the U.S. military. While recent increases in military pay are likely to go some way towards addressing this issue, many experts believe that more must be done if military pay is to remain competitive in the future (Hosek and

Sharp, 2001). Not withstanding the importance of relative civilian/military compensation, it also seems clear that the nature of military employment also plays a role in the decision to enter and remain in military employment. Widespread sexual harassment among military personnel is likely to be inconsistent with recruitment and retention objectives.

We examine this issue using data from a 1995 U.S. Department of Defense survey of active-duty women in the Army, Navy, Marine Corps, Air Force, and Coast Guard. Overall, 70.9 percent of women on active duty in the U.S. military report experiencing some type of sexually harassing behavior in the 12 months prior to the survey. Using single-equation probit models we find a strong positive relationship between experiencing a sexually harassing behavior and dissatisfaction with military employment and intention to leave the military. These results are consistent with previous results for women employed as lawyers in the United States (Laband and Lentz, 1998).

Unobserved heterogeneity in individual characteristics causes single-equation estimates of the effect of sexually harassing behavior to be overstated, however. Once the correlation in the unobserved factors associated with reporting sexual harassment and job satisfaction are taken into account, experiencing a sexually harassing behavior does not in and of itself significantly increase dissatisfaction with military employment. Furthermore, women's views about the unwanted gender-related behaviors they experience are closely related to subsequent outcomes. Women who view their experiences as sexual harassment have significantly higher levels of overall job dissatisfaction and heightened intentions to leave the military than women who experience the same behaviors, but who do not believe themselves to have been sexually harassed. The estimated negative effect of the sexually harassing behavior itself on overall job

satisfaction is substantially reduced—and the effect on intentions to remain in military employment eliminated—once these views are taken into account.

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Table 1:
Incidence of Sexually Harassing Behaviors,
Job Satisfaction and Likelihood of Remaining in the Military

	Incidence of Behavior	(Very) Dissatisfied	(Very) Satisfied	(Very) Unlikely to Remain	(Very) Likely to Remain
Total		0.187	0.626	0.280	.579
Crude/Offensive Behavior	0.692	0.214	0.578	0.298	0.550
(1) Been Often Told Sex Jokes	0.490	0.233	0.554	0.302	0.541
(2) Whistled at in Sexual Way	0.388	0.225	0.549	0.312	0.533
(3) Unwelcome Sex Discussions	0.395	0.247	0.531	0.315	0.522
(4) Sexual Remarks in Public or Private	0.400	0.252	0.531	0.306	0.535
(5) Remarks re Body/Sex Acts	0.367	0.259	0.520	0.326	0.506
(6) Offensive Sexual Gestures	0.332	0.247	0.536	0.308	0.530
(7) Stared at in a Sexual Way	0.395	0.236	0.544	0.313	0.533
(8) Harasser Exposed Self	0.047	0.281	0.492	0.328	0.504
Unwanted Sexual Attention	0.408	0.234	0.544	0.308	0.522
(1) Attempts to Establish Sex Relationship	0.284	0.251	0.514	0.321	0.508
(2) Asked for Dates After You Said No	0.269	0.248	0.520	0.316	0.503
(3) Touch Made You Uncomfortable	0.232	0.257	0.522	0.303	0.534
(4) Unwanted Attempts to Kiss You	0.157	0.277	0.491	0.312	0.514
Sexual Coercion	0.123	0.285	0.458	0.330	0.476
(1) Implied Reward if You Have Sex	0.076	0.276	0.470	0.317	0.494
(2) Scared if You Don't Cooperate w/ Sex	0.056	0.324	0.405	0.312	0.463
(3) Treated You Badly b/c Refused Sex	0.070	0.327	0.404	0.343	0.445
(4) Implied Faster Promotion for Sex	0.034	0.383	0.410	0.332	0.482
(5) Fear Treated Badly if No Sex	0.043	0.347	0.376	0.343	0.421
(6) Offer Sex to You in Return for Favor	0.023	0.374	0.430	0.305	0.526
No Behavior Reported	0.291	0.124	0.737	0.237	0.644

Note: Sampling weights used. The number of observations for the total sample, the sample who reported crude/offensive behavior, unwanted sexual attention, sexual coercion, and no behavior are 19467, 12827, 6884, 1806, and 6278, respectively. The number of observations for the eight components of crude/offensive behavior are (1) 9187, (2) 6434, (3) 6735, (4) 7147, (5) 5984, (6) 5751, (7) 6784, and (8) 751. The number of observations for the four components of unwanted sexual attention are (1) 4528, (2) 4132, (3) 3925, and (4) 2310. The number of observations for the six components of sexual coercion are (1) 1114, (2) 832, (3) 983, (4) 549, (5) 631, and (6) 381.

Table 2: Determinants of Sexually Harassing Behaviors by Type of Behavior (Probit Marginal Effects and Standard Errors)

	Any Sexually Harassing Behavior		Sexual Attention/Coercion		Sexual Coercion	
Demographic & Human Capital Characteristics						
Married	-0.083 ***	(0.007)	-0.145 ***	(0.007)	-0.045 ***	(0.004)
Black	-0.043 ***	(0.009)	0.003	(0.009)	0.013 ***	(0.004)
Hispanic	0.010	(0.018)	0.008	(0.019)	0.003	(0.010)
Other	0.011	(0.016)	0.037 **	(0.017)	0.024 ***	(0.010)
Years of Duty	-0.014 ***	(0.003)	-0.016 ***	(0.003)	-0.000	(0.002)
Years of Duty Squared	0.000 **	(0.000)	0.000 *	(0.000)	-0.000	(0.000)
Education						
Less than BA	0.078 ***	(0.011)	0.039 ***	(0.011)	0.007	(0.005)
BA	0.047 ***	(0.016)	-0.000	(0.017)	-0.014 *	(0.008)
Greater than BA	0.046 ***	(0.017)	-0.007	(0.019)	-0.021 **	(0.009)
Current Job Characteristics						
Service						
Navy	-0.066 ***	(0.011)	-0.074 ***	(0.010)	-0.040 ***	(0.004)
Marines	-0.016	(0.014)	-0.019	(0.013)	-0.020 ***	(0.005)
Airforce	-0.084 ***	(0.009)	-0.089 ***	(0.009)	-0.051 ***	(0.004)
Coast Guard	-0.087 ***	(0.017)	-0.124 ***	(0.014)	-0.052 ***	(0.004)
Male Supervisor	0.013	(0.009)	-0.004	(0.009)	-0.002	(0.005)
Gender Mix of Work Group						
Male Dominated	0.064 ***	(0.010)	0.033 ***	(0.010)	0.025 ***	(0.005)
Female Dominated	0.010	(0.011)	0.018	(0.013)	0.024 ***	(0.008)
Pay Scale						
E1- E3	0.101 ***	(0.023)	0.203 ***	(0.030)	0.176 ***	(0.033)
E4	0.133 ***	(0.019)	0.211 ***	(0.026)	0.135 ***	(0.026)
E5 - E6	0.087 ***	(0.018)	0.133 ***	(0.021)	0.055 ***	(0.014)
E7 - E9	0.055 ***	(0.017)	0.104 ***	(0.022)	0.037 ***	(0.015)
W1	0.047	(0.031)	0.061 *	(0.038)	0.014	(0.023)
O1 – O3	0.025 *	(0.015)	0.034 *	(0.018)	0.006	(0.011)
MOS Uncommon for Gender	0.078 ***	(0.010)	0.075 ***	(0.012)	0.023 ***	(0.006)
Supervisor	0.045 ***	(0.008)	0.046 ***	(0.008)	0.015 ***	(0.004)
Located in USA	-0.028 ***	(0.010)	-0.035 ***	(0.010)	-0.011 **	(0.005)
In Training-Related Duty	0.016 *	(0.009)	0.005	(0.009)	0.014 ***	(0.005)
Serving on a Ship	0.117 ***	(0.017)	0.083 ***	(0.021)	0.028 **	(0.012)
Duty Station Has:						
Sexual Harassment Hotline	-0.012	(0.008)	-0.030 ***	(0.009)	-0.008 *	(0.005)
Sexual Harassment Office	-0.025 ***	(0.008)	-0.021 ***	(0.008)	0.007 *	(0.004)
Complaint Process	-0.081 ***	(0.009)	-0.064 ***	(0.010)	-0.040 ***	(0.005)
Sexual Harassment Training	-0.038 ***	(0.008)	-0.025 ***	(0.008)	-0.017 ***	(0.004)
N	19,467		19,467		19,467	

Notes: (1) See the text for variable definitions. (2) *** Significant at less than 1 percent, ** significant at less than 5 percent, * significant at less than 10 percent.

Table 3: The Effect of Sexually Harassing Behaviors on Job Satisfaction (Probit Marginal Effects and Standard Errors)

Prob(Measure of Job Satisfaction)	Measure of Sexually Harassing Behavior	$\partial JS/\partial SH$	Std. Error
(Very) Dissatisfied with Job[a]	Any Sexually Harassing Behavior	0.053 ***	(0.005)
(Very) Satisfied with Job[b]	Any Sexually Harassing Behavior	-0.086 ***	(0.007)
(Very) Unlikely to Remain[c]	Any Sexually Harassing Behavior	0.018 ***	(0.007)
(Very) Likely to Remain[d]	Any Sexually Harassing Behavior	-0.033 ***	(0.008)
(Very) Dissatisfied with Job[a]	Sexual Attention/Coercion	0.044 ***	(0.006)
(Very) Satisfied with Job[b]	Sexual Attention/Coercion	-0.068 ***	(0.007)
(Very) Unlikely to Remain[c]	Sexual Attention/Coercion	0.021 ***	(0.007)
(Very) Likely to Remain[d]	Sexual Attention/Coercion	-0.036 ***	(0.008)
(Very) Dissatisfied with Job[a]	Sexual Coercion	0.079 ***	(0.010)
(Very) Satisfied with Job[b]	Sexual Coercion	-0.125 ***	(0.013)
(Very) Unlikely to Remain[c]	Sexual Coercion	0.028 **	(0.011)
(Very) Likely to Remain[d]	Sexual Coercion	-0.042 ***	(0.013)

[a] Relative to very satisfied, satisfied, and neither satisfied nor dissatisfied.
[b] Relative to very dissatisfied, dissatisfied, and neither satisfied nor dissatisfied.
[c] Relative to very likely, likely, and neither likely nor unlikely.
[d] Relative to very unlikely, unlikely, and neither likely nor unlikely.

Notes: (1) Intentions to remain in the military equations include the following controls: married, black, Hispanic, other, years of duty, years of duty squared, less than BA, BA, greater than BA, Navy, Marines, Airforce, Coast Guard, male supervisor, male dominated, female dominated, pay categories, MOS uncommon for gender, supervisor, U.S. location, training-related duty, sexual harassment hotline, sexual harassment office, complaint process, and sexual harassment training. (2) Job satisfaction equations include all the same controls except married. (3) See the text for variable definitions. (4) *** Significant at less than 1 percent, ** significant at less than 5 percent, * significant at less than 10 percent.

Table 4: The Effect of Sexually Harassing Behaviors on Job Satisfaction

Prob(Measure of Job Satisfaction)	Measure of Sexually Harassing Behavior	Bivariate Probit			2SLS	
		Marginal Effect (st. error)	P > |z|	Rho	Coefficient (st. error).	P > |z|
(Very) Dissatisfied with Job[a]	Any Sexually Harassing Behavior	0.014	0.805	0.104	0.052	0.382
		(0.058)		(0.143)	(0.059)	
(Very) Satisfied with Job[b]	Any Sexually Harassing Behavior	0.005	0.946	-0.155	-0.067	0.368
		(0.067)		(0.115)	(0.074)	
(Very) Dissatisfied with Job[a]	Sexual Attention/Coercion	0.044	0.235	0.000	0.036	0.346
		(0.040)		(0.093)	(0.038)	
(Very) Satisfied with Job[b]	Sexual Attention/Coercion	-0.055	0.234	-0.019	-0.045	0.355
		(0.048)		(0.081)	(0.048)	
(Very) Dissatisfied with Job[a]	Sexual Coercion	-0.004	0.925	0.170	0.103	0.344
		(0.046)		(0.105)	(0.109)	
(Very) Satisfied with Job[b]	Sexual Coercion	-0.053	0.433	-0.097	-0.127	0.355
		(0.069)		(0.100)	(0.137)	

[a] Relative to very satisfied, satisfied, and neither satisfied nor dissatisfied. [b] Relative to very dissatisfied, dissatisfied, and neither satisfied nor dissatisfied.
[c] Relative to very likely, likely, and neither likely nor unlikely. [d] Relative to very unlikely, unlikely, and neither likely nor unlikely.

Note: Independent variables as defined in Table 3.

Table 5: The Effect of Considered Sexual Harassment on Job Satisfaction (Probit Marginal Effects and Standard Errors)

	Model 1		Model 2		Model 3		Model 4	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
(Very) Dissatisfied with Job[a]								
View as Sexual Harassment	0.052***	(0.006)	0.033***	(0.007)	0.042***	(0.006)	0.043***	(0.006)
Any Sexually Harassing Behavior			0.033***	(0.007)				
Sexual Attention/Coercion					0.021***	(0.007)		
Sexual Coercion							0.055***	(0.010)
(Very) Satisfied with Job[b]								
View as Sexual Harassment	-0.081***	(0.007)	-0.050***	(0.009)	-0.064***	(0.008)	-0.067***	(0.007)
Any Sexually Harassing Behavior			-0.056***	(0.009)				
Sexual Attention/Coercion					-0.036***	(0.009)		
Sexual Coercion							-0.092***	(0.013)
(Very) Unlikely to Remain[c]								
View as Sexual Harassment	0.023***	(0.006)	0.021**	(0.008)	0.018**	(0.007)	0.021***	(0.007)
Any Sexually Harassing Behavior			0.005	(0.009)				
Sexual Attention/Coercion					0.012	(0.008)		
Sexual Coercion							0.019*	(0.012)
(Very) Likely to Remain[d]								
View as Sexual Harassment	-0.042***	(0.007)	-0.037***	(0.009)	-0.033***	(0.008)	-0.039***	(0.008)
Any Sexually Harassing Behavior			-0.010	(0.010)				
Sexual Attention/Coercion					-0.020**	(0.009)		
Sexual Coercion							-0.024*	(0.013)

[a] Relative to very satisfied, satisfied, and neither satisfied nor dissatisfied. [b] Relative to very dissatisfied, dissatisfied, and neither satisfied nor dissatisfied.
[c] Relative to very likely, likely, and neither likely nor unlikely. [d] Relative to very unlikely, unlikely, and neither likely nor unlikely.

Note: (1) Independent variables as defined in Table 3. (2) *** Significant at less than 1 percent, ** significant at less than 5 percent, * significant at less than 10 percent. (3) The number of observations is 19,232.

Table 6: Determinants of Viewing Sexually Harassing Behavior as "Sexual Harassment" (Probit Marginal Effects and Standard Errors)

	Model 1		Model 2	
Type of Sexually Harassing Behavior				
Sexual Attention/Coercion			0.242 ***	(0.009)
Sexual Coercion			0.198 ***	(0.012)
Demographic and Human Capital Characteristics				
Married	-0.019 **	(0.009)	0.026 ***	(0.009)
Black	-0.010	(0.010)	-0.029 ***	(0.011)
Hispanic	0.024	(0.022)	0.022	(0.022)
Other	0.013	(0.019)	-0.000	(0.020)
Years of Duty	0.001	(0.003)	0.005	(0.003)
Years of Duty Squared	-0.000	(0.000)	-0.000	(0.000)
Education				
Less than BA	0.045 ***	(0.013)	0.048 ***	(0.014)
BA	0.028	(0.020)	0.045 **	(0.020)
Greater than Ba	0.018	(0.022)	0.036	(0.022)
Current Job Characteristics				
Service				
Navy	-0.085 ***	(0.013)	-0.061 ***	(0.013)
Marines	-0.042 **	(0.016)	-0.034 **	(0.017)
Airforce	-0.102 ***	(0.012)	-0.077 ***	(0.012)
Coast Guard	-0.082 ***	(0.021)	-0.038 *	(0.021)
Male Supervisor	0.026 **	(0.011)	0.032 ***	(0.012)
Gender Mix of Work Group:				
Male Dominated	0.059 ***	(0.012)	0.059 ***	(0.013)
Female Dominated	0.047 ***	(0.014)	0.041 ***	(0.015)
Pay Scale				
E1- E3	0.070 **	(0.031)	0.002	(0.034)
E4	0.070 **	(0.027)	0.015	(0.029)
E5 - E6	-0.000	(0.024)	-0.037	(0.024)
E7 - E9	-0.011	(0.024)	-0.039	(0.025)
W1	0.011	(0.042)	0.001	(0.043)
O1 – O3	-0.022	(0.021)	-0.031	(0.021)
MOS Uncommon for Gender	0.072 ***	(0.012)	0.061 ***	(0.013)
Supervisor	0.013	(0.010)	0.004	(0.010)
Located in USA	-0.030 **	(0.012)	-0.022 *	(0.012)
In Training-Related Duty	0.007	(0.011)	0.004	(0.011)
Serving on a Ship	-0.000	(0.022)	-0.011	(0.023)
Duty Station Has:				
Sexual Harassment Hotline	-0.019 *	(0.010)	-0.012	(0.011)
Sexual Harassment Office	0.012	(0.009)	0.013	(0.010)
Complaint Process	-0.075 ***	(0.011)	-0.061 ***	(0.011)
Sexual Harassment Training	-0.056 ***	(0.010)	-0.055 ***	(0.010)
N	12,954		12,954	

Notes: (1) See the text for variable definitions. (2) *** Significant at less than 1 percent, ** significant at less than 5 percent, * significant at less than 10 percent.

Appendix

This appendix outlines the procedure we used to calculate the power of our proposed binary instruments. We have modified the calculation suggested by Evans, *et al.* (1999) to allow for the fact that we have unequal numbers of individuals for whom the instrument takes positive and zero values.[34]

To illustrate, consider the following bivariate regression model:

$$y_i = \alpha + \beta x_i + \varepsilon_i \tag{1'}$$

where y_i is our measure of job dissatisfaction and x_i is a discrete measure of sexual harassment. Let z_i be our proposed binary instrument (i.e., marital status or ship status). The IV estimate of β is the same as the Wald estimate used in the evaluation literature (Angrist, 1990) and is given by the following:

$$\beta_{IV} = \frac{(\bar{y} \mid z_i = 1) - (\bar{y} \mid z_i = 0)}{(\bar{x} \mid z_i = 1) - (\bar{x} \mid z_i = 0)} = \frac{(\bar{y}_1 - \bar{y}_0)}{(\bar{x}_1 - \bar{x}_0)} = \frac{\delta_1}{\delta_2} \tag{2'}$$

where $\bar{y}_1 = (y \mid z = 1)$ is the mean of y_i for those individuals with $z_i = 1$ and $\bar{y}_0$, $\bar{x}_1$, and $\bar{x}_0$ are defined in a similar fashion. The numerator (δ_1) in the above expression is calculated from a regression of job dissatisfaction (y) on our proposed instrument (z) and the statistical significance of the resulting coefficient drives the statistical significance of the 2SLS estimate.

Let n_1 = the number of individuals for whom $z = 1$, n_0 = the number of individuals for whom $z = 0$ with $n_1 + n_0 = n$. This implies that:

$$\bar{y} = \frac{n_1}{n}\bar{y}_1 + \frac{n_0}{n}\bar{y}_0 \tag{3'}$$

Rearranging equation (4') first to solve for $\bar{y}_1$ and then again for $\bar{y}_0$ results in the following:

$$\begin{aligned} \bar{y}_1 &= \bar{y} + \frac{n_0}{n}\delta_1 \\ \bar{y}_0 &= \bar{y} - \frac{n_1}{n}\delta_1 \end{aligned} \tag{4'}$$

with

$$Var(\delta_1) = Var(\bar{y}_1 - \bar{y}_0) = \frac{\bar{y}_1(1-\bar{y}_1)}{n_1} + \frac{\bar{y}_0(1-\bar{y}_0)}{n_0}. \tag{5'}$$

Substituting equations (4') into equation (5') results in the following expression for the variance of δ_1:

$$Var(\delta 1) = A\delta_1^2 + B\delta_1 + C \tag{6'}$$

where

$$\begin{aligned} A &= \left[-\frac{n_0^2}{n^2 n_1} - \frac{n_1^2}{n^2 n_0} \right] \\ B &= (1-2\bar{y})\left[\frac{n_0}{n n_1} - \frac{n_1}{n n_0} \right] \\ C &= \bar{y}(1-\bar{y})\left[\frac{1}{n_1} + \frac{1}{n_0} \right] \end{aligned} \tag{7'}$$

Whenever the following holds, δ_1 will be statistically significant at the 5 percent level:

$$\begin{aligned} &|\delta_1| > 1.96 \cdot \sqrt{Var(\delta_1)} \\ &|\delta_1| > M \end{aligned} \tag{8'}$$

Since $\delta_1 = \beta_{IV}\delta_2$ we can use the above expression to address the following question: For a β_{IV} of a particular magnitude (which we take to be the single equation estimates presented in Table 3), how much must the instrument change the probability of observing the endogenous

[34] In order to simplify the calculation the authors assume that the number of individuals for whom the instrument takes the value of 1 equals the number for whom the instrument equals 0. In our case, this is not a realistic

variable—i.e., how large must δ_2 be—in order to generate and estimate of δ_1 which is significant at 5 percent? The answer is given by:

$$|\delta_2| > \frac{M}{|\beta_{IV}|} \tag{9'}$$

In other words, to identify a statistically significant reduced-form estimate between y and *z* of a size comparable to the single-equation estimates in Table 3 the discrete instrument for *x* must change the probability of reporting sexual harassing behaviors by at least the amount given in equation (9').

These calculations are useful for highlighting the relationships between overall sample size, the proportion of the population with $z = 1$, the magnitude of the effect of *z* on *y*, and the relationship between the *z* and *x* in detecting significant effects using IV regression. Everything else equal, significant effects are, not surprisingly, more likely to be detected when overall sample sizes are larger and when the magnitude of the effect to be detected (β_{IV}) is larger. Similarly, significant effects are also more likely to be detected when the population is evenly split between those individuals for whom the instrument takes on the value of one and those for whom it takes on a value of zero. Finally, there is a positive relationship between the power of the instrument to predict the endogenous x variable and probability of detecting significant effects.

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assumption because only 3.4 percent of the active-duty women in our sample are currently serving on ships.

Appendix Table A1:
Power of Instruments

Prob(Measure of Job Satisfaction)	Measure of Sexually Harassing Behavior	Significance Level at Which Estimated Effect Would Be Detected	
		Ship Status	Married
(Very) Dissatisfied with Job[a]	Any Sexually Harassing Behavior	> 30 percent	20-30 percent
(Very) Satisfied with Job[b]	Any Sexually Harassing Behavior	> 30 percent	10-20 percent
(Very) Dissatisfied with Job[a]	Sexual Attention/Coercion	> 30 percent	10-20 percent
(Very) Satisfied with Job[b]	Sexual Attention/Coercion	> 30 percent	5-10 percent
(Very) Dissatisfied with Job[a]	Sexual Coercion	> 30 percent	20-30 percent
(Very) Satisfied with Job[b]	Sexual Coercion	> 30 percent	20-30 percent

[a]In each case the magnitude of the effect is taken to be that which would be generated from a single equation probit model ignoring endogeneity. These estimates are given in Table 3.