Our findings both confirm and contradict some of the common assumptions about the association between deployment and retention of officers in the U.S. military. For example, we find a clear positive association between increasing amounts of nonhostile deployment and junior and midgrade officer retention: Officers who participate in more nonhostile deployments are retained at a higher rate in all services. Hostile deployment generally mitigates this positive effect but, in almost all cases examined, even those with some or all hostile deployment show higher retention rates than do nondeployers.

The major differences we found by service include the Air Force showing the most pronounced effect of hostile deployment and the Marine Corps and Navy showing the least effect of hostile deployment. In all services except the Air Force, in the late 1990s, we saw the effect of hostile deployment was less for midgrade officers than for junior officers.

Thus, in contradiction to the common consensus, deployment is not associated with higher separation. However, if we confine our attention to a specific amount of deployment in the late 1990s, higher amounts of hostile deployment are generally associated with lower retention rates compared with the rates of junior officers who have the same amount of nonhostile deployment. This effect is most pronounced in the Air Force, but is also true for the Army and Marine Corps. The Navy shows little effect on junior officers and a slight positive effect on midgrade officers. In fact, three of the four services show a mitigation or mild reversal of the effect of hostile deployment
between junior and midgrade officers—an effect likely due to self-selection.

While we found some differences in the early 1990s, defined for the purposes of this analysis to span from 1990 through 1995, the overall, general nonhostile results were consistent with late-1990s results. One noticeable difference between the two periods was that Army and Marine Corps junior officers and Navy midgrade officers showed increased retention with increasing amounts of hostile deployment, while Marine Corps midgrade officers showed the opposite result. We hypothesize that these patterns were unique to that period, which was a time of significant contraction for the U.S. military and its officer corps. For example, from 1990 to 1996 the officer corps experienced a 22-percent reduction in size and in the early 1990s the officer corps contracted dramatically for three years in a row, shrinking 5.9 percent from 1991 to 1992, another 6.2 percent in 1993, and a further 4.4 percent in 1994.

In summary, for the time period we examined and the observed level of deployment, the fundamental pattern for junior and midgrade officers is that more deployment is associated with higher retention. For junior officers, hostile deployment tends to mitigate the positive association with retention, while (except for the Air Force) for midgrade officers, it tends to have a mitigating effect in general and perhaps a slightly positive effect for midgrade Navy and Marine Corps officers.

There are a number of possible explanations for why these results are at odds with the common wisdom that deployment is bad for retention:

- **Perception versus reality.** It may be that deployment is perceived as negative when in fact it has exactly the opposite effect. For example, it could be that servicemembers find deployment to be a convenient or socially acceptable scapegoat on surveys. The evidence for long and/or hostile deployments from this work and Hosek and Totten (1998) certainly does not support the popular negative perception of deployment.

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1While the discussion presented here has been in terms of episodes of deployment, additional analyses based on length of deployment provide similar results.
• **Alternate types of deployment are negative.** However, it also may be that the types of deployment captured with our measures have an aggregate positive effect because of their nature (as we described above), while other types of deployment we could not capture with our pay-based measures are negative. For example, it may be that short, unplanned or unforeseen deployments—not included in our data—have a strongly negative effect.²

• **Self-selection mechanisms.** It also could be that those officers with the greatest dislike of deployment self-select into nondeploying positions prior to exiting the military.

• **Aggregation effects.** These results characterize how aggregates of officers responded to particular patterns of hostile and non-hostile deployment. As such, they shed little light on how a particular individual officer would respond if he or she experienced one or more additional deployments.

**ASSOCIATION VERSUS CAUSATION**

Because of the third point above, we have carefully avoided any discussion about whether changes in deployment cause differences in officer retention. It is reasonable to expect that this is true, but given the nature of our data and an observational, retrospective study format, we cannot account for the effects of individual self-selection. Self-selection occurs because officers have at least some control over their future positions in the military. Such control implies that the officers have some influence over how likely they are to deploy because different positions have known, higher likelihoods of deploying than do others. This further implies that the associations between retention and deployment we have observed could have resulted in some significant way from each individual’s choice.

For example, the observed increased retention between junior officers with no deployment and those junior officers with some deployment could be attributed to the fact that deployment is a pos-

²Some of the services have implemented efforts to make deployment more predictable, such as the Air Force reconfiguration into expeditionary forces. If the hypothesis is that unplanned and unforeseen deployment has the greatest negative effect, then efforts to improve deployment predictability should be very beneficial.
itive experience that motivates junior officers to remain in the mil-
itary. However, if deployment is perceived as beneficial to selection
for promotion and other advancement opportunities, then it could
just as well result from career-motivated junior officers selecting bil-
lets that are more likely to deploy. These same officers, who are
more likely to remain in the military, would then also be more likely
to deploy.\textsuperscript{3}

Even if deployment does not offer an advancement advantage, it is
possible that those individuals who prefer military life, and are thus
more likely to stay in the military, also prefer positions that are more
likely to deploy. It is also possible that those left behind from deploy-
ing units are forced to work harder than their deploying counter-
parts, so that deployment may be causing increased attrition among
those who did not deploy, not increased retention among the
deployers.

With our data, we have no way of discerning whether one of these
possibilities, some combination of them, or some other factor has
caused the results we have observed.

**HYPOTHESES UNLIKELY TO BE TRUE**

While we cannot prove that more deployment causes higher reten-
tion in this study, we can cast doubt on other hypotheses.

**“More Deployment Causes Lower Retention”**

Our results show that more deployment—at least long and/or hostile
deployment as modeled here—is associated with higher retention. If
more long and/or hostile deployment caused lower retention, we
would expect to see this in our data. Because we observe exactly the
opposite, we can conclude that this hypothesis is not likely to be true,
at least in the aggregate for populations similar to those we observed.

However, this does not mean that, on an individual-by-individual
basis, more deployment might cause particular officers to have lower

\textsuperscript{3}The mitigation of hostile deployment effects between junior and midgrade officers is
evidence of one type of self-selection.
probabilities of remaining in the military. Nor does it mean that increased amounts of deployment, greater than what we have observed in our data, would not cause a decrease in retention.

“Hostile Deployment Is Causing Lower Retention”

For Army, Navy, and Marine Corps midgrade officers, using the same logic as in the previous case, we can conclude that this hypothesis is probably false. If this hypothesis were true, we would see greater and more-consistent effects than the data show for midgrade officers. For junior officers, on the other hand, this hypothesis may be true in the sense that among those junior officers with the same amount of deployment, we generally observe lower retention among those with a larger fraction of hostile deployment. However, hostile deployment does not result in retention rates worse than those experienced by those who do not deploy.

DIRECTIONS FOR FUTURE RESEARCH

There are a number of important directions in which to take this research. To continue the previous discussion, additional data would allow us to more carefully investigate the causal connection between deployment and officer retention. To advance such an evaluation, additional data on officer career paths would be required, and we would have to create much more detailed models. With such data and models, we could attempt to compare and contrast the retention behavior of officers with similar characteristics and career paths. Any such study would still be subject to observational study criticisms, but the more carefully we could construct homogeneous groups, the closer we could come to unraveling causes and effects.

Evaluating the Extent of Self-Selection

To put these results in proper context, it is necessary to better understand how much influence officers have on their future job assignments, and particularly how that selection impacts their likelihood of deployment and their likelihood of remaining on active duty. As we have previously described, it is possible that officers planning to leave active duty self-select into jobs that do not deploy prior to exit-
ing the service. If so, then the observed association is a result of self-selection and it would be incorrect to infer that deployment causes improved retention.

Such an evaluation will be service-specific and probably occupation-specific. That is, the policies and practices that affect how much control an officer has over his or her career certainly varies by service and may also vary by occupation. An initial evaluation might entail the identification of a small number of occupations in one service and a list of unit identification codes (UICs) that deploy. From this information, we could look to see if there are significant differences in retention among those in deployable UICs and those in non-deployable UICs. For example, we could look at all surface line officers in the Navy and separate them into those assigned to ships and those who are not. If it turns out that those not assigned to ships also leave the Navy at a higher rate, then it is possible that self-selection is a factor behind some or all of the observed association. This could then be corroborated with exit interviews of particular servicemembers.

**Evaluating the Effect of Short and/or Unplanned Deployments**

Based on the results of this work, we hypothesize that short and/or unplanned deployments may have a negative impact on retention. That is, one explanation for the positive association we find between deployment and retention is that the impact of deployment is minimized or perhaps even completely eliminated when deployments are known in advance and the servicemember can plan for them. Also, when the deployments are of national and military significance, as is likely with those to hostile areas, then servicemembers may more readily accept a negative impact on their personal lives. If this is correct, then it also may be true that short and/or unforeseen deployments have significant negative impacts on retention. Using the same logic, it could be that because these types of deployment are hard or impossible to plan for, and perhaps because they also are of a more routine nature, servicemembers are less able to justify the deployment’s negative impact.
While the deployment measures derived from pay data cannot capture short deployments, data currently being collected by DMDC and detailed service-specific data do capture this information. DMDC’s data will take some time to compile given that the effort was only recently begun. In the interim, while DMDC collects enough longitudinal data to support an analysis such as the one reported on here, some work could proceed using service-specific data. For example, it may be possible to use service-specific data to derive a set of deployments, remove those already accounted for in the DMDC Perstempo dataset, and then evaluate the effect of those—the short deployments—that remain.

**Accounting for Officer Quality**

The military officer manning is designed around an “up or out” promotion system: To remain in the service, an officer must progress up the rank structure according to schedule or be forced to leave the service. Furthermore, because the officer corps is also strongly pyramidal, with fewer and fewer officers as rank increases, each service brings in a large quantity of junior officers and slowly sheds them over time, through either voluntary or involuntary attrition.

We have found that increasing deployments are associated with higher retention rates. However, what would presumably be of more interest to the military is determining whether deployment affects the retention of high-quality officers. Unfortunately, there is no measure of officer quality in the current dataset, so we currently cannot tell if deployments have a differential effect by quality.

Future work could seek to derive a measure of officer quality and then test the effect of deployments on the high-quality officers. There are no readily available measures of quality, and for junior officers there is virtually no variation in the obvious surrogate measures, such as time in grade. Development of such quality measures will not be trivial because the data are not likely to be readily available, nor will they be easily amenable to simple algorithmic derivations. However, there are some communities within the officer corps that might lend themselves to simpler measures of quality. For example, in the medical community, specific medical qualifications and certifications could be used to measure quality. These are obvi-
ously related to medical officer quality and should be readily available.

**Detailed Modeling of Specific Communities**

Whether or not quality is incorporated into the models, more-detailed models of specific officer communities would provide more information. The current models account for community differences only in the broadest manner. For example, all pilots are assigned to one occupational category even though there are certainly differences in deployment by aircraft type. Detailed modeling would allow us to better account for differences within each community and to more carefully investigate the causal question. For example, hostile deployment seems to have a very negative effect for Navy junior officers in legal occupations. This is very different from all other Navy occupational categories.