The Relationship Between Deployment and Turnover in Australian Navy Personnel

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Available online: 31 Mar 2009

To cite this article: Isla Carboon, Mark Creamer Ph.D., Andrew B. Forbes, Dean P. McKenzie, Alexander C. McFarlane & Helen L. Kelsall (2009): The Relationship Between Deployment and Turnover in Australian Navy Personnel, Military Psychology, 21:2, 233-240

To link to this article: http://dx.doi.org/10.1080/08995600802574647

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The Relationship Between Deployment and Turnover in Australian Navy Personnel

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Increases in the frequency of operations tempo have focused attention on the relationship between deployment and separation from military service. This retrospective study explored the association between deployment and turnover over a 10-year period in Royal Australian Navy (RAN) personnel. Participants were 2355 males who served in the RAN during the period of the 1991 Gulf War (August 1990–September 1991); approximately half had been deployed to that conflict. Data were collected 10 years later as part of the Australian Gulf War Veterans’ Health Study. During that 10-year period, 61% of participants left the RAN. The likelihood of separation decreased as number of deployments increased even when controlling for age, rank, and length of service. Personnel deployed to the 1991 Gulf conflict did not have...
a significantly higher risk of separation. The results provide evidence that deployment is not necessarily a risk factor for separation.

The relationship between deployment and separation from military service has become an important topic for researchers in recent years. Difficulties in recruitment and retention, in the context of a marked increase in operations (optempo), have focused attention on the relationship between various indices of personnel workload (perstempo) and turnover. Deployment may be either a risk or protective factor for separation, as the relationship can be moderated by a variety of factors. The purpose of the current study was to explore the association between deployment and turnover during a 10-year period in Royal Australian Navy (RAN) personnel.

A study of U.S. military officers over the period 1990–1999 (Fricker, 2002; Hosek & Totten, 1998) found a positive association between increasing numbers of nonhostile deployments and retention. Fricker also reported that, while hostile deployments did not display the same positive relationship with retention, overall, officers with experience of hostile deployment were more likely to remain in service than those with no deployment history. Hosek and Totten (2002) also identified a positive association between nonhostile deployments and retention, while finding no relationship between hostile deployments and reenlistment decisions. Another study by Hosek and Totten (1998) found that long (>30 days) or hostile deployments increased likelihood of reenlistment in personnel without prior experience of such deployments. However, for personnel who had already done this type of duty during the 3 years prior to their reenlistment decision, the effect was reversed, with higher perstempo becoming a risk factor for separation. These findings suggest that, in terms of personnel retention, some deployment is better than none but too much creates a greater risk of separation—an association best characterized as a curvilinear risk effect.

Castro and Adler’s (1999) Optempo Readiness model also proposes a curvilinear relationship between perstempo and retention. They argue for an optimum level of perstempo to promote retention, with more or less than this amount increasing separation risk. Recently, Huffman and colleagues (Huffman, Adler, Dolan, & Castro, 2005) found support for this hypothesis in the relationship between one index of perstempo, TDY (temporary duty) and intention to separate in U.S. Army personnel. However, two other perstempo measures—number of deployments and days spent on training exercises—did not display significant curvilinear relationships with separation intention in their sample. Other studies examining intention to separate have mixed findings. Wong, Bliese, and Halverson’s (1995) study of soldiers deployed in Haiti found that personnel with previous deployments were more likely to express desire to separate than were personnel on their first deployment, while Reed and Segal (2000) found no rela-
relationship between the number of nonhostile deployments and reenlistment intentions.

Data from surveys of separating personnel regarding their reasons for leaving do not offer any obvious support for a cumulative or curvilinear risk effect. On one hand, the finding that 48% of junior (18–26 years) Royal Australian Army personnel who separated during 1995–1996 listed “Lack of excitement and action in a peacetime Army” as a “very considerable influence” on their decision to leave. Goyne (1999) supports the idea that lack of active deployment experience is a risk factor for separation. At the other end of the spectrum, only 18% of 16,000 U.S. personnel separating from service in 2000 chose “Too many deployments” as “very influential” in their decision to leave, making it the 13th most commonly endorsed motivator for separation (Hoover, Randolph, Elig, & Klein, 2001).

In order to explore posited associations between deployment experience and turnover, the current study utilized an existing dataset of RAN personnel to examine data related to deployment and separation over the 10 years following the 1991 Gulf War. The first aim was to examine the data for evidence supporting an association between deployment and turnover. The second aim was to examine whether deployment to a major, hostile conflict (the 1991 Gulf War) had a differential effect on turnover.

METHOD

Participants and Procedure

The data used in the current study were collected as part of the Australian Gulf War Veterans’ Health Study (AGWVHS: Sim et al., 2003). Participants were 2,355 males who served in the RAN during the period of the Gulf War (August 1990–September 1991). Of the total sample, 1,232 (52%) were Gulf War veterans. The remaining 1,123 participants were RAN personnel in operational units during that period but not deployed to that conflict and who consented to be part of a randomly selected comparison group in the AGWVHS study. This group was matched to the Gulf War veteran group using 3-year age bands. Analyses in this study were limited to RAN males due to the small numbers of Army and Air Force personnel, as well as females, among study participants. Participants were recruited via mailed invitation, with two further mailings and intensive follow-up phone contact for nonresponders. Details of the recruitment and the demographic characteristics of the study participants have been reported previously (Creamer et al., 2006; Ikin et al., 2004).

Data used in these analyses were drawn from self-report questionnaires included in the AGWVHS protocol, which were distributed and returned by post.
over the period August 2000–April 2002. The questionnaires included demo-
graphic information (age, education level, marital status, service type, and rank in
1990), as well as details of any active deployments of one week or longer. Spec-
cifically, participants were asked: “Have you been on an active deployment (war or
peacekeeping)? This does not include training exercises or goodwill visits.” They
were asked the duration of each deployment; those of less than one week were not
included in the analysis.

Data Analysis

Sample Weighting

The aims of the original study from which the data were drawn meant that the
sample contained a disproportionately large number of personnel who had been
deployed to the 1991 Gulf War when compared to the total number of RAN per-
sonnel eligible for that deployment. In order to correct for this discrepancy, all
analyses incorporated sampling weights, which were calculated as the reciprocal
of the probabilities of selection for the original study multiplied by the age-specific
participation rates in that study.

To explore whether deployment activity was related to separation over time,
discrete time survival analysis was used (Singer & Willett, 2003). Person-years
were accrued for each calendar year and for time-dependent variables of number of
deployments, age (in 5-year intervals), and length of military service. Annual rates
of separation were then computed for these variables as well as for rank (in 1990).
These annual rates can be considered as a person’s probability of leaving the ser-
vices in the next year according to their level of each factor. Annual relative risks
(RR) of separation were computed using the discrete time version of propor-
tional hazards regression, known as *complementary log-log binary regression*
(Singer & Willett, 2003), and weighted using the sampling weights described
above. The analysis for each variable controlled for the effects of other variables
examined (number of deployments, calendar year, age band, rank, and length
of service). Statistical analyses were carried out using the Stata 8.2 package
(StataCorp, 2004).

RESULTS

During the 10-year period between the 1991 Gulf War and this study, 1,438 (61%)
of the participants separated from the RAN. Table 1 displays the overall incidence
of separation relative to the number of active deployments undertaken by person-
nel during their entire period of service, their rank (in 1990), and their length of
service. Other than Gulf War duty, the most common deployments were those to
the Gulf region outside the period of the war, with next most common being peacekeeping/peacemaking activities in the Pacific region (e.g., East Timor, Bougainville). The data show that the likelihood of separation decreased as the number of deployments increased. This negative linear trend was significant, controlling for calendar year, age band, rank (in 1990), and length of service ($p < .001$). The data indicate that at the start of any year, personnel who had been deployed once during their military career had a reduced risk of separation in that year of approximately 14% compared to personnel with no deployment experience. Having a history of two deployments lowered the annual risk by an additional 19%, and in the group with three or more deployments the likelihood of separation was half that of the group with no deployments. Deployment to the Gulf War did not have a significant effect on the overall rate of separation (adj $RR = 1.08$, 95% CI $= 0.88–1.32$).

Relative risks of separation were also calculated for calendar year, age band, rank (in 1990), and length of service. Only rank and length of service displayed significant differences. The data for rank indicate that commissioned officers had the lowest separation rates. Non-commissioned officers were almost twice as

### TABLE 1

Rate and Risk of Separation by Number of Deployments, Rank, and Length of Service

<table>
<thead>
<tr>
<th>Number of deployments</th>
<th>$n$</th>
<th>% of $N$ separated</th>
<th>Annual Separation Rate (%)</th>
<th>Relative Risk</th>
<th>Adj. RR$^a$</th>
<th>95% CI</th>
<th>$p$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>805</td>
<td>72.1</td>
<td>9.0</td>
<td>1.0</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>976</td>
<td>63.8</td>
<td>7.7</td>
<td>0.83</td>
<td>0.86</td>
<td>0.75–0.98</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>382</td>
<td>46.9</td>
<td>6.7</td>
<td>0.69</td>
<td>0.67</td>
<td>0.54–0.82</td>
<td></td>
</tr>
<tr>
<td>3+</td>
<td>192</td>
<td>29.2</td>
<td>5.2</td>
<td>0.52</td>
<td>0.50</td>
<td>0.36–0.69</td>
<td></td>
</tr>
<tr>
<td>Linear trend</td>
<td></td>
<td></td>
<td></td>
<td>0.82</td>
<td>0.76–0.88</td>
<td>&lt; .001</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rank (at August 1, 1990)</th>
<th>$n$</th>
<th>% of $N$ separated</th>
<th>Annual Separation Rate (%)</th>
<th>Relative Risk</th>
<th>Adj. RR$^a$</th>
<th>95% CI</th>
<th>$p$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commissioned officers</td>
<td>361</td>
<td>43.5</td>
<td>4.9</td>
<td>1.0</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-commissioned officers</td>
<td>1172</td>
<td>62.3</td>
<td>8.4</td>
<td>1.76</td>
<td>1.95</td>
<td>1.59–2.39</td>
<td></td>
</tr>
<tr>
<td>Other ranks</td>
<td>821</td>
<td>65.9</td>
<td>9.5</td>
<td>2.03</td>
<td>2.60</td>
<td>2.00–3.37</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Linear trend</td>
<td></td>
<td></td>
<td></td>
<td>1.57</td>
<td>1.39–1.78</td>
<td>&lt; .001</td>
<td>.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length of service</th>
<th>$n$</th>
<th>% of $N$ separated</th>
<th>Annual Separation Rate (%)</th>
<th>Relative Risk</th>
<th>Adj. RR$^a$</th>
<th>95% CI</th>
<th>$p$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–5</td>
<td>109</td>
<td>100.0</td>
<td>5.7</td>
<td>1.0</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6–10</td>
<td>468</td>
<td>100.0</td>
<td>10.9</td>
<td>1.53</td>
<td>1.46</td>
<td>1.05–2.05</td>
<td></td>
</tr>
<tr>
<td>11–15</td>
<td>507</td>
<td>43.6</td>
<td>5.9</td>
<td>0.79</td>
<td>1.05</td>
<td>0.70–1.57</td>
<td></td>
</tr>
<tr>
<td>16–20</td>
<td>602</td>
<td>48.2</td>
<td>6.6</td>
<td>0.87</td>
<td>0.94</td>
<td>0.62–1.44</td>
<td></td>
</tr>
<tr>
<td>&gt;20 Years</td>
<td>652</td>
<td>51.5</td>
<td>13.9</td>
<td>1.88</td>
<td>2.23</td>
<td>1.42–3.50</td>
<td></td>
</tr>
</tbody>
</table>

$^a$All estimates controlled for age, calendar year, and other factors reported in the table.
likely to separate than their commissioned counterparts and other ranks were at 2.5 times greater risk of separation than commissioned officers. The length of service data demonstrate a bimodal pattern with a significantly elevated risk of separation for personnel with 6–10 years of service and for those with greater than 20 years of service when compared to the reference group of early career (1–5 years) personnel.

**DISCUSSION**

The current data demonstrate a negative relationship between increasing deployments and risk of separation. These findings mirror the effect found by Fricker (2002), extending their findings from an officer-only sample across all ranks of a naval service. Findings suggest that higher rank is protective against separation and that there separation peaks relative to length of service. Importantly, the association between increasing deployments and lower separation risk was significant even when controlling for other influential factors.

The simplest explanation for the current findings regarding deployments is that the kinds of activities undertaken on deployment are, in fact, what draws people to join the Armed Forces in the first place. Experience of deployments serves to enhance their identity as a member of the military, as well as commitment to their career. This is, however, not a simple relationship as previous studies have provided evidence that particular qualities of deployments, such as hostile and lengthy missions, may moderate effects on subsequent separation. We found no significant difference in overall separation over the 10-year study period between those who did, and did not, deploy to the 1991 Gulf conflict (which was clearly a hostile deployment). While the current research was unable to address this issue in more detail, since the numbers were not sufficiently large to generate differential findings following other specific deployments, it does suggest that the relationship between hostile deployments and turnover is not straightforward.

The current analyses controlled for participants’ lengths of military service. Thus, the finding that deployments have a protective influence on retention is not simply explained by the fact that those who were in the RAN longer had more opportunity to deploy. Nevertheless, the current findings can be interpreted within the context of the learning hypothesis previously discussed by Hosek and Totten (1998, 2002). They argue that personnel use their deployment experience to inform decisions about the desirability of future deployment, with those who do not find deployment satisfying more likely to leave the service as soon as possible to avoid further deployment. Controlling for length of service only partially addresses this issue. A related factor is whether or not personnel can choose to deploy or are able to choose a career within the military that is more or less likely to involve deployment. In the current study sample, all participants were RAN person-
nel who, as members of a ship’s company, are obligated to take part in all of the ship’s deployments.

In interpreting the current findings, a key cautionary question is whether this pattern of results is generalizable outside periods of low optempo. The decade 1991–2001 was not a time of high deployments for the Australian Defence Force. In contrast, the last 5 years have seen a much higher optempo for Australian and many allied defense forces. Due to the small number of personnel in the sample with more than three deployments, we were unable to assess whether the linear trend extended to personnel with more deployments. It is possible that, in line with the previous studies demonstrating a curvilinear associations between turnover and various indices of perstempo (Castro & Adler, 1999; Hosek & Totten, 1998), greater deployment numbers might have a different effect on separation. Due to the relatively low number of deployments undertaken by the sample, the findings are probably best represented as evidence of how separation is associated with experience of deployment rather than how it is related to the intensity of deployment within a given period (an index of perstempo).

The sample for this research was drawn from a single service (Navy), and as previous studies have found that perstempo-turnover patterns vary between different services (Hosek & Totten, 1998), this suggests caution in generalizing the results to other branches of the military. Similarly, there were no female personnel in the sample. This may be important, since there is evidence indicating women are more likely to experience high levels of stress in response to deployment activities (Adler, Huffman, Bliese, & Castro, 2005). Any interpretation of the protective effect of higher rank should also be tempered by fact that, in this study, rank was a time-invariant factor—recorded as at 1990—so that changes in rank over the 10-year period were not taken into account in the analyses. Nonetheless, the study has many strengths, including large sample size, the 10-year time frame, and the use of actual separations rather than self-report of intention to separate as an index of turnover. As such, the data provide an important addition to the literature examining the effects of deployment on separation from military service. The findings have practical implications for military personnel resource planning.

ACKNOWLEDGEMENTS

This research was funded by the Australian Government—Department of Veterans’ Affairs and the Australian Defence Force. The Australian Centre for Post-traumatic Mental Health is partially funded by the Department of Veterans’ Affairs. Professor McFarlane is Chair of the Mental Health Consultative Group to the Director General of the Health Service Branch of the Australian Defence Force.
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