

Technical Report 1190

**Pre- to Middeployment Assessment of Unit Focused
Stability Impact on Cohesion**

Monte D. Smith

Human Resources Research Organization

Joseph D. Hagman

U.S. Army Research Institute

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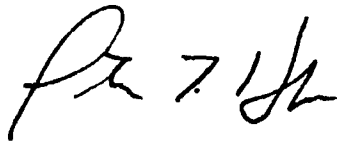
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MICHELLE SAMS
Acting Director

Technical review by

Brooke Schaab, U.S. Army Research Institute
LTC Cheryl Moman, U.S. Army Human Resources Command, DCSPLANS

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14. ABSTRACT (<i>Maximum 200 words</i>) This third in a planned series of reports on research with U.S. Army Alaska's 172d Stryker Brigade Combat Team (SBCT) sought to (a) assess the impact of heightened personnel stability (under Unit Focused Stability [UFS] manning) on cohesion, and (b) identify factors that enhance or detract from (are predictive of) this impact over the 6-month interval between unit pre- and middeployment. The same 669 Soldiers from platoons organic to three infantry battalions, one field artillery battalion, and one cavalry squadron completed paper-and-pencil questionnaires at the end of garrison-based predeployment and again midway through overseas deployment. Results revealed that horizontal (Soldier to Soldier) cohesion remained unchanged, whereas vertical (Soldier to leader) and organizational (Soldier to unit/Army) cohesion dropped from pre- to middeployment. Leader effectiveness and learning environment were the best predictors of cohesion, especially vertical and organizational cohesion. Efforts to stabilize personnel under UFS during predeployment were perceived to have a positive (albeit limited) impact on cohesion, performance, morale, and unit commitment, with performance being the primary beneficiary. JRTC-based training during predeployment was also perceived to enhance middeployment individual and collective performance. Results were interpreted to suggest that (a) heightened UFS-imposed personnel stability will not by itself increase cohesion from pre- to middeployment, and (b) without a concerted effort to promote effective leadership and a positive learning environment for Soldiers, horizontal cohesion is unlikely to change from pre- to middeployment, whereas vertical and organizational cohesion is likely to drop. Findings also suggest that personnel stability, as well as JRTC-based training, during predeployment are both likely to benefit individual and collective performance during the first 6 months of deployment.								
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Technical Report 1190

**Pre- to Middeployment Assessment of Unit Focused
Stability Impact on Cohesion**

Monte D. Smith
Human Resources Research Organization

Joseph D. Hagman
U.S. Army Research Institute

Force Stabilization Research Unit
Linnea Ruth, Chief

U.S. Army Research Institute for the Behavioral and Social Sciences
2511 Jefferson Davis Highway, Arlington, VA 22202-3926

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**Personnel Performance and
Training**

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PRE- TO MIDDEPLOYMENT ASSESSMENT OF UNIT FOCUSED STABILITY IMPACT ON COHESION

EXECUTIVE SUMMARY

Research Requirement:

The U.S. Army's Human Resources Command (HRC) requested that the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) conduct lifecycle-based assessment to identify (a) the impact of heightened personnel stability (under Unit Focused Stability [UFS] manning) on cohesion, and (b) variables that enhance or detract from (are predictive of) this impact. U.S. Army Alaska's 172d Stryker Brigade Combat Team (SBCT), the first unit to undergo UFS manning, was selected by the Army to support assessment. This report provides results obtained over the 6-month period between the 172d SBCT's end of predeployment and subsequent middeployment overseas. In doing so, it extends results obtained earlier during predeployment while the unit was in garrison (Smith & Hagman, 2004; Smith & Hagman, in publication).

Procedure:

The same 669 Soldiers from platoons organic to three infantry battalions, one field artillery battalion, and one cavalry squadron completed paper-and-pencil questionnaires at the end of garrison-based predeployment and again midway through overseas deployment. Questionnaires included demographic items and assessment scales designed to measure horizontal (Soldier to Soldier), vertical (Soldier to leader), and organizational (Soldier to unit/Army) cohesion, as well as unit climate. Questions were also included to assess how heightened predeployment personnel stability under UFS impacted middeployment cohesion, performance, morale, and unit commitment, and how Joint Readiness Training Center (JRTC) training during predeployment impacted individual and collective middeployment performance.

Findings:

Horizontal cohesion remained unchanged while vertical and organizational cohesion dropped from pre- to middeployment. Unit climate variables were related to cohesion, whereas demographic variables were not, at least not to the same degree as the former. Consistent with earlier in-garrison findings (Smith & Hagman, 2004, in publication), the unit climate variables of leader effectiveness and learning environment were the best predictors of cohesion, especially vertical and organizational. Heightened personnel stability under UFS during predeployment was perceived to have a positive (albeit limited) impact on cohesion, performance, morale, and unit commitment, with performance being the primary beneficiary. And finally, JRTC-based training during predeployment was perceived to have a beneficial impact on performance between pre-and middeployment.

Utilization and Dissemination of Findings:

To the extent that the current findings from the 172d SBCT, and supporting evidence cited from other sources, generalize to other UFS-manned units, the Army can be reasonably confident that (a) heightened personnel stability under UFS will not by itself increase cohesion from unit pre- to middeployment, and (b) without a concerted effort to promote effective leadership and a positive learning environment for Soldiers, horizontal cohesion is unlikely to change from pre- to middeployment, whereas vertical and organizational cohesion are likely to drop. Additional findings can be taken to suggest that heightened personnel stability under UFS, as well as JRTC-based training, during predeployment are likely to benefit individual and collective performance, at least during the first 6 months of deployment.

PRE- TO MIDDEPLOYMENT ASSESSMENT OF UNIT FOCUSED STABILITY IMPACT ON COHESION

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Pre- to Middeployment Assessment of Unit Focused Stability Impact on Cohesion

Introduction

The U.S. Army's traditional personnel manning system (the Individual Replacement System, or IRS) was in place for much of the 20th Century. IRS was developed around concepts and practices drawn from industrial mass production and essentially treated Soldiers as "spare parts" who could be swapped in and out of units not unlike spare parts in a giant industrial machine (Furukawa, Ingraham, Kirkland, Marlowe, Martin, & Schneider, 1987). Soldiers were replaced within units whenever their enlistments expired, or transferred between units as needed, with little thought for how this could complicate training, disrupt group dynamics, and ultimately undermine unit cohesion (or cohesiveness). This system was efficient but, when combined with a personnel management philosophy that emphasized career development of individual Soldiers over organizational stability of the units to which they belonged, it generated excessive turbulence. Increasingly over the years, the IRS system was blamed as the source of excessive and unnecessary disruption. Its critics claimed it broke up established units, demoralized Soldiers, and weakened unit cohesion (Johns, 1984).

In October of 2002, the Vice Chief of Staff of the Army, created Task Force Stabilization (TFS) and charged it with the mission to develop a manning system that would minimize personnel turbulence. In response, TFS developed Unit Focused Stability (UFS), a manning system where, unlike under IRS, Soldiers assemble, train, and deploy together with their leaders during the operational lifecycle of their unit (Headquarters, Department of the Army, 2006; Task Force Stabilization, 2004, March 16; 2004, May 1).

The Army expects heightened stability under UFS to foster cohesion over time and, in turn, lead to enhanced unit performance (e.g., Thurman, 1989; Towell, 2004). While the notion that enhanced cohesion will have a positive impact on performance has received empirical support (e.g., Ingraham & Manning, 1981; Manning & Ingraham, 1987, Mullen & Copper, 1994; Oliver, Harmon, Hoover, Hayes, & Pandhi, 1999; Levine, Moreland, Argote, & Carley, 2005; Moskos, 1969; Siebold, 1999), the notion that heightened stability is linked to enhanced cohesion has not.

Past research into the relation between stability and cohesion has been inconclusive. For most units stabilized in the 1980s under Project COHORT (Cohesion, Operational Readiness, and Training), for example, cohesion started out high and dropped over time (e.g., Henderson, 1985; Thurman, 1989; Vaitkus, 1994). For others, cohesion followed a U-shaped pattern (i.e., started out high, fell to a low point about midway into the units' lifecycle, and then rebounded somewhat toward the end [Siebold, 1989]). In contrast, cohesion within a medical unit on a 6-month overseas peacekeeping mission followed the opposite inverted U-shaped pattern, (i.e., started out low, peaked at midmission, and tailed off at mission's end) (Bartone & Adler, 1999). Absent has been the monotonically increasing pattern of cohesion the Army expects to occur as Soldiers spend more and more time together in the same unit. Clearly, the temporal course of cohesion under UFS cannot be predicted on the basis of past research findings.

Given this uncertainty, Human Resources Command (HRC) asked the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to (a) assess the impact of UFS on

cohesion over the entire operational lifecycle of U.S. Army Alaska's 172d Stryker Brigade Combat Team (SBCT), the first unit to shift from IRS to UFS manning, (b) identify variables that enhance or detract from (are predictive of) this impact, and (c) document lessons learned for improving future UFS implementation. In response, ARI began a longitudinal research program designed to address these objectives.

Results to date have shown that: (a) cohesion started out high near the beginning of the 172d SBCT's planned 36-month lifecycle and then dropped over time in garrison (i.e., during predeployment) despite heightened personnel stability under UFS, (b) cohesion was directly related to perceived leader effectiveness and unit learning environment, (c) cohesion was positively related to unprogrammed personnel turbulence as long as it was not excessive and occurred relatively early in the 172d SBCT's lifecycle, (d) higher cohesion was associated with enhanced platoon-level performance, and (e) future UFS implementation could be enhanced by establishment of clear and firm guidelines, uniform adherence to these guidelines, alleviation of Soldier concerns regarding the potential negative impact of UFS on career development, and attention to a host of unit- (e.g., inadequate housing and training support infrastructure) and location-specific (i.e., Alaska) challenges.

These results were obtained from analysis of questionnaire, interview, and focus group information gathered at 3, 9, 18, and 20 months (i.e., measurement periods M1-M4) into the 172d SBCT's predeployment garrison phase of its 36-month operational lifecycle. The present research extends this analysis to questionnaire-only information gathered during the first 6 months (i.e., measurement period M5) of the ensuing overseas deployment (technically middeployment) phase of the 172d SBCT's lifecycle. In doing so, this research sought to answer the following questions:

1. How does cohesion change from pre- to middeployment (i.e., M4 to M5)?
2. What variables are related to (are predictive of) cohesion at pre- and middeployment?
3. What impact do platoon member and platoon leader stability during predeployment have on cohesion, performance, morale, and unit/Army commitment at middeployment?
4. What impact does predeployment training at JRTC have on middeployment platoon performance?

Method

Participants, Design, and Procedure

A total of 669 Soldiers from platoons organic to three infantry battalions, one field artillery battalion, and one cavalry squadron of the 172d SBCT (see Table 1 for demographics) were surveyed via questionnaire both at the end of stateside predeployment (M4) and again midway through overseas deployment (M5). An on-site research team member supervised questionnaire administration in both instances, with unit sergeants major or first sergeants responsible for questionnaire distribution and collection both in garrison and in country. After taking 30-45 minutes to complete the questionnaires, respondents sealed them in envelopes and printed the

first letter of their last name and the last four digits of their social security number on the front of the envelopes to enable coded longitudinal tracking.

Table 1
Respondent Demographics at M5

Variable	
Number of Soldiers Completing M4 and M5 Questionnaires	669
	%
Sex	
Male	100
Female	0
Rank	
Enlisted (E1-E4)	56
NCO (E5-E8)	40
Officer (O1-O6)	4
Age	
Under 20	3
20-29	80
30-39	16
40+	1
Race ^a	
Hispanic	16
American Indian or Alaskan Native	4
Asian	2
Black or African American	8
Pacific Islander	1
White	81
Education	
High School or Less	63
Some College	31
Bachelor's Degree	6
Graduate Training	
Marital Status	
Single	42
Married	54
Divorced or Separated	4
Member of Previous 172d SIB	
Yes	27
No	73
Assignment Status	
Volunteer	34
Assigned	66
Residence	
On Post	78
Off Post	22

^aPercentages sum to > 100 because of multiple responses.

Identical questionnaires were used at both measurement periods with the exception of several items added to the end of the M4 questionnaire to assess platoon-level collective performance during a JRTC rotation completed 3 weeks earlier and a series of items added to the end of the M5 questionnaire to assess the extent to which predeployment stability in garrison impacted cohesion, performance, morale, and unit commitment at middeployment. Research participation was voluntary and all obtained information was treated as confidential.

Questionnaires

The questionnaires contained items on demographics (e.g., age, gender, and education) and military status (e.g., rank, unit, and duty position), hereafter simply referred to as demographic items, and assessment scales covering cohesion and unit climate (i.e., leader effectiveness, learning environment, job motivation, job satisfaction, attitude toward stability, morale, and personal and family well-being). The latter were selected on the basis of their suspected importance to cohesion development (e.g., Bartone & Adler, 1999; Griffith, 1988; Kirkland, Bartone, & Marlowe, 1993; Oliver, et al., 1999) and their potential for modification through targeted Army intervention (e.g., training).

The cohesion scale consisted of items from Siebold and Kelly's (1988a) Platoon Cohesion Index, with minor wording changes made to optimize fit with the current application. These items were used to measure three types of bonding: between peers (Soldier to Soldier), between leaders and their subordinates (Soldier to leader, and vice versa), and between Soldiers and their unit (Soldier to unit/Army). These dimensions were labeled as horizontal, vertical, and organizational cohesion, respectively, and measured accordingly: horizontal cohesion by the extent to which peers trusted and cared about one another and worked together to get the job done; vertical cohesion by the extent to which leaders and Soldiers trusted and cared about each other and the extent to which leaders were judged competent to lead Soldiers in training/combat; organizational cohesion by the extent to which Soldiers identified with their unit and what it stands for (e.g., were proud of their unit, accepted being labeled as a unit member, supported unit values, and felt a sense of pride in unit membership) and by the extent to which Soldiers worked to achieve unit objectives in exchange for the unit facilitating attainment of Soldier needs and goals (i.e., Soldiers did their best for the unit if the unit did its best for them).

The scale items used to measure these three dimensions are shown in Table 2. The psychometric properties of each scale, as well as additional information concerning scale development, are reported by Siebold and Kelly (1988b). The scales used to assess unit climate were either taken directly from Siebold (1996) (i.e., job motivation), adapted from Siebold (1996) or the Sample Survey of Military Personnel (U.S. Army Research Institute for the Behavioral and Social Sciences, 2003, Fall) (i.e., leader effectiveness, learning environment, job motivation and satisfaction, morale, and personal and family well-being), or developed anew (attitude toward stability) specifically for this research. Representative items from these scales, listed in order of highest item-scale correlations at M1 (in parentheses), are shown in Table 3. Cronbach's alpha and split-half reliability coefficients for all scales are reported in Smith and Hagman (2004).

Table 2
Cohesion Scale Items

<i>Horizontal</i>	
In my platoon, Soldiers ...	• Trust each other. • Care about each other. • Work well together to get the job done. • Work well as a team.
<i>Vertical</i>	
In my platoon, Soldiers ...	• Trust their leaders. • Care about their leaders. • Can get help from their leaders on personal problems. • Train well together with their leaders.
In my platoon, Leaders ...	• Have the skills and abilities to lead Soldiers in combat.
<i>Organizational</i>	
In my platoon, Soldiers ...	• Feel they play an important part in accomplishing the unit's mission. • Feel proud to be members of the unit. • Know what is expected of them. • Know the behaviors that will get them in trouble or punished. • Are satisfied with the time available for family, friends, and personal needs. • Are satisfied with unit social events. • Feel they are serving their country. • Have opportunities to better themselves. • Set the example for Army values.
In my platoon, Leaders ...	• Set the example for Army values of loyalty, duty, respect, selfless service, honor, integrity, and personal courage.

Scale items were answered on a five point, Likert-type response scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Most questions asked respondents to act as observers of their respective platoons and to rate the level of the referent object (e.g., teamwork, trust, and caring) with respect to those platoons. The last page of the questionnaire was left blank in order to give respondents an open opportunity to elaborate on any topic(s) of concern.

Table 3
Representative Unit Climate Scale Items

Attitude toward Force Stability (2 items)

- I think the goal of stabilizing Soldiers in the 172d SBCT is a good idea. (.77)
- I think the goal of stabilizing Leaders in the 172d SBCT is a good idea. (.77)

Leader Effectiveness (15 items)

Leaders in my platoon ...

- Show they are the kind of leaders one would want to serve under in combat. (.87)
- Work hard and try to do as good a job as possible. (.85)
- Demonstrate they have the expertise to show their Soldiers how best to perform a task. (.85)

Learning Environment (10 items)

In my platoon, Soldiers ...

- Feel leaders have confidence that their Soldiers will do their jobs right. (.82)
- Are provided with guidance when assigned new duties. (.79)
- Feel the emphasis is on getting things right, and not just on looking good. (.79)

Job Motivation (4 items)

- I am very personally involved in my work. (.83)
- I look forward to starting work each day. (.82)
- I don't mind taking on extra duties and responsibilities. (.74)

Job Satisfaction (8 items)

I am satisfied with ...

- The quality of my training. (.77)
- The number of personnel available to support my training. (.77)
- My education/training opportunities. (.74)

Morale (2 items)

- The morale level in my unit is good. (.92)
- My morale level is good. (.92)

Personal Well-Being (5 item)

- My mental health status is good. (.77)
- I am satisfied with the Army as a way of life. (.74)
- My unit works hard to provide equal opportunity for all. (.73)

Spouse/Family Well-Being (9 items)

- The quality of Army child care programs is good. (.75)
- The availability of Army child care programs is good. (.74)
- The availability of family medical care is good. (.71)

Treatment of Data

Data were machine scored, entered into a Statistical Package for the Social Sciences for Windows (SPSS, 2004) database, and examined for quality/consistency prior to the start of analysis. Three percent of the records obtained at both questionnaire administrations were discarded because of the lack of response variability (i.e., the same response was given to every nondemographic item) or a coded personal tracking identifier. The rejection region for all statistical analyses was .01.

Results

Question 1: How Does Cohesion Change from Pre- to Middeployment (i.e., M4 to M5) ?

A 2 (duty position; platoon leader [platoon leader, platoon sergeant, squad/team leaders] platoon member) x 2 (measurement period; M4, M5) x 3 (cohesion dimension; horizontal, vertical, organizational) mixed factorial analysis of variance (ANOVA) with repeated measures on the second and third variables was used to answer this question. Results are plotted in Figures 1 and 2 for platoon leaders and members, respectively.

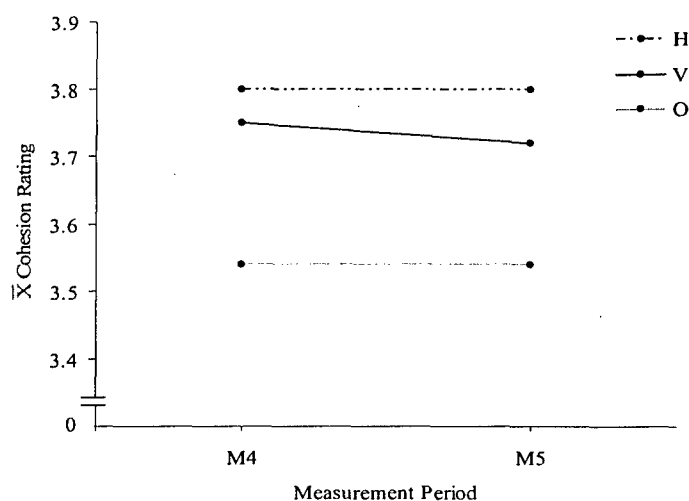


Figure 1. Platoon leader ratings for horizontal (H), vertical (V), and organizational (O) cohesion at pre- (M4) and middeployment (M5).

Results revealed a significant main effect of cohesion dimension, $F(2, 1334) = 177.27$, a significant Cohesion Dimension x Duty Position interaction, $F(2, 1334) = 13.63$, and a significant Measurement Period x Cohesion Dimension interaction, $F(3, 1334) = 7.14$. Post hoc Tukey Honestly Significant Difference (HSD) tests (Sprinthall, 2003) of simple effects confined first to the Cohesion Dimension x Duty Position interaction revealed that leaders ($df = 333$) perceived no difference in magnitude between horizontal and vertical cohesion, yet both were perceived to be significantly higher than organizational cohesion. Platoon members ($df = 336$), in contrast, perceived horizontal cohesion to be higher than vertical and organizational cohesion while the latter two dimensions were perceived not to differ from one another.

Post hoc HSD tests of simple effects confined next to the Cohesion Dimension x Measurement Period interaction indicated that horizontal cohesion did not change from M4 to M5, while both vertical and horizontal cohesion decreased significantly ($df = 669$). Although vertical and organizational declines appeared to be more pronounced among platoon members than leaders, the associated three-way interaction was not significant.

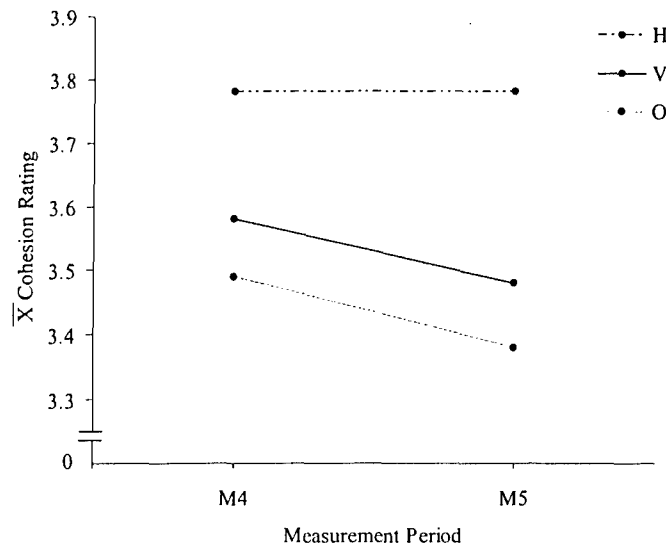


Figure 2. Platoon member ratings for horizontal (H), vertical (V), and organizational (O) cohesion at pre- (M4) and middeployment (M5).

Question 2: What Variables are Related to (Are Predictive of) Cohesion at Pre- and Middeployment?

To answer this question, correlational analyses were used to assess the relation between overall cohesion and a variety of both unit climate and demographic variables at both M4 and M5. These analyses were then extended to assess the relation between these same unit climate and demographic variables and each of the three cohesion dimensions at each measurement period. In general, cohesion was more highly related to unit climate variables than to demographic variables and the associative linkages found for the former were relatively stable from pre- to middeployment for overall cohesion and its three dimensions.

Overall Cohesion

Unit climate variables. All unit climate variables directly related to overall cohesion at both M4 and M5. Table 4 lists these variables in the order of their strength of relation with overall cohesion at M4. The mean correlation (r) between overall cohesion and unit climate variables was .60 at M4 and .61 at M5. The Spearman rank-order correlation between M4 and M5 coefficients of correlation was significant, with $r(8) = .99$. Thus, the correlations between overall cohesion and unit climate variables were both robust at, and stable across, the two measurement periods.

Table 4
Correlations Between Cohesion (Overall, Horizontal, Vertical, and
Organizational) and Predictor Variables at M4 and M5

Predictor Variables	Overall Cohesion		Horizontal Cohesion		Vertical Cohesion		Organizational Cohesion	
	M4	M5	M4	M5	M4	M5	M4	M5
Unit Climate								
Learning Environment	.79*	.81*	.59*	.63*	.75*	.76*	.77*	.75*
Leader Effectiveness	.79*	.83*	.58*	.58*	.82*	.84*	.74*	.76*
Job Satisfaction	.66*	.65*	.47*	.47*	.59*	.58*	.68*	.64*
Job Motivation	.65*	.63*	.48*	.48*	.57*	.55*	.66*	.62*
Personal Well-Being	.63*	.63*	.50*	.45*	.58*	.53*	.61*	.58*
Morale	.58*	.62*	.40*	.42*	.50*	.53*	.61*	.60*
Family Well-Being	.37*	.36*	.28*	.30*	.29*	.33*	.40*	.36*
Attitude Toward Stability	.29*	.32*	.22*	.24*	.25*	.23*	.29*	.27*
Demographic								
Expected Years of Service	.17*	.14*	.13*	.09	.16*	.17*	.16*	.12*
Rank	.14*	.14*	.10	.07	.18*	.16*	.11*	.13*
Duty Position	-.13*	-.20*	-.07	-.16*	-.17*	-.24*	-.11*	-.17*
Months in SBCT	-.11*	-.07	-.06	-.05	-.12*	-.05	-.11*	-.08
Paygrade	.10	.15*	.08	.12*	.13*	.18*	.07	.13*

Note: This and all subsequent tables represent $p \leq .01$ with an asterisk. Entries in Table 4 have a maximum n of 669. Actual n for any particular variable was 669 minus the number of Soldiers missing data on that variable. For M4 overall cohesion and morale, for instance, $n = 661$. With the exception of family well-being, n values fell within a narrow range. At M4 for overall cohesion, for example, this range was 647-667. Thus, n values were omitted from the table to enhance readability. Family well-being n values, on the other hand, were substantially lower because only Soldiers with families were asked the items comprising this scale. At M4, for instance, the family well-being correlation with overall cohesion was based on $n = 444$.

Demographic variables. Relations found between overall cohesion and demographic variables were less robust. Table 4 lists these variables only if statistical significance with overall cohesion, or with one or more cohesion dimension, was achieved during at least one of the two measurement periods. Four demographic variables were correlated significantly with overall cohesion at both M4 and M5 (i.e., expected years of service, rank, duty position, and months in the SBCT). The mean absolute correlations, however, were modest in magnitude, averaging only $r = .13$ and $.14$, at M4 and M5, respectively. Moreover, the Spearman rank-order correlation between M4 and M5 absolute coefficients of correlation was nonsignificant. Thus, the relations found between demographic variables and overall cohesion were weak at M4 and M5 (never exceeding $r = .20$) and statistically unstable from one time period to the next. Moreover, even the strongest demographic variables (expected years of service at M4 and duty

position at M5) fell short of the weakest unit climate variable (attitude toward stability) in terms of their correlation with overall cohesion.

Horizontal Cohesion

Unit climate variables. The mean correlation between horizontal cohesion and unit climate variables was $r = .44$ and $.45$ at M4 and M5, respectively. The Spearman rank-order correlation between M4 and M5 coefficients of correlations was significant, $r(8) = .93$. Thus, the relations found between unit climate variables and horizontal cohesion were reliable, of low to moderate strength, and stable across the two measurement periods.

Demographic variables. The mean absolute correlations between demographic variables and horizontal cohesion at M4 and M5 were both nonsignificant. The associated Spearman rank-order correlation was also nonsignificant. Thus, no reliable overall associative pattern was found between horizontal cohesion and demographic variables.

Vertical Cohesion

Unit climate variables. Mean correlations between vertical cohesion and unit climate variables at both M4 and M5 were $r = .54$. The Spearman rank-order correlation between M4 and M5 coefficients of correlation was significant, with $r(8) = .96$. Thus, the relations found between vertical cohesion and unit climate variables were reliable, of moderate strength, and stable across the two measurement periods.

Demographic variables. Mean absolute correlations between vertical cohesion and demographic variables at M4 and M5 were $r = .15$ and $.16$, respectively. The Spearman rank-order correlation between M4 and M5 coefficients (absolute values) was nonsignificant. Thus, the associative pattern between vertical cohesion and demographic variables was weak and unstable over time.

Organizational Cohesion

Unit climate variables. Mean correlations between organizational cohesion and unit climate variables at M4 and M5 were $r = .60$ and $.57$, respectively. The Spearman rank-order correlation between M4 and M5 coefficients was significant, $r(8) = .97$. Thus, the strength of relations found between organizational cohesion and unit climate variables was reliable, of moderate strength, and stable from pre- to middeployment.

Demographic variables. Demographic variables, in contrast, were weakly associated with organizational cohesion at both M4 and M5, and their structural relations were unstable from one measurement period to the other. Mean absolute correlations between organizational cohesion and demographic variables at M4 and M5 were $r = .11$ and $.13$, respectively, whereas the Spearman rank-order correlation between M4 and M5 coefficients (absolute values) was nonsignificant.

Unit Climate Variables vs. Demographic Variables

The mean correlation between unit climate variables and cohesion dimensions at M4 and M5 was .53. Learning environment and leader effectiveness were most closely related to cohesion at both M4 and M5. Job satisfaction, job motivation, morale, and personal well-being formed a second tier of potential predictors, always positively related to cohesion but to a lesser degree than learning climate and leader effectiveness. A third, noticeably weaker, tier of predictors consisted of family well-being and attitude toward stability.

The mean absolute correlation between the listed demographic variables and all cohesion dimensions at M4 and M5 was only $r = .13$. Moreover, while Spearman rank-order correlations between M4 and M5 were stable and robust for unit climate variables (averaging $r = .96$), they were weak and inconsistent for demographic variables, averaging an absolute value of $r = .22$ and an algebraic mean correlation of $-.02$. Thus, only unit climate variables were expected to have predictive utility.

Cohesion Prediction Models

Prediction models were developed for overall, horizontal, vertical, and organizational cohesion at both M4 and M5. To develop each model, all unit climate variables (excluding family well-being, which was withheld because of restricted sample size) and all demographic variables with a significant relation to cohesion (see Table 4) were made available to iterative stepwise multiple regression routines. For example, to develop the M4 overall cohesion model, all unit climate variables and all listed demographic variables with the exception of pay grade (which was not significantly related to cohesion) were made available to the model. To develop the M4 horizontal cohesion prediction model, all unit climate variables plus expected years of service (the only demographic variable significantly related to the criterion) were made available to the model. Results from all eight individual prediction models (see Appendix A for details) indicated that the vast majority of all predicted variance in any model was accounted for by the first three predictors to enter the regression equation. To facilitate comparison across models, however, all significant predictors are listed in Tables 5-8 in the order of their equation entry.

Overall cohesion. The M4 and M5 overall cohesion prediction models, shown in Table 5, were similar, with leader effectiveness and learning environment emerging as the first two predictors to enter both models. These two predictors were joined by job motivation, attitude toward stability, and personal well-being in the M4 model and by personal well-being, job satisfaction, and morale at M5. In both models, 99% of the total variance accounted for by the full model could be attributed to the first three predictors.

Horizontal cohesion. At M4, leader effectiveness was the dominant predictor of horizontal cohesion, accompanied by personal well-being, learning environment, and attitude toward stability (Table 6). At M5, only two variables entered the prediction equation: learning environment and personal well-being. Note that although only two predictors entered the model at M5, the predictive strength of the model actually increased, from .38 at M4 (based on four predictors) to .45 at M5 based on only two predictors. It was as if combat conditions focused

attention on the elements most directly related to small-unit cohesion: a positive learning environment and a sense of personal well-being.

Table 5
Overall Cohesion Prediction Models at M4 and M5

Overall Cohesion Prediction Model	Significant Predictors	R^2 Based on First Three Predictors	R^2 Based on Full Model
M4	Leader Effectiveness Learning Environment Job Motivation Attitude Toward Stability Personal Well-Being	.68	.69
M5	Learning Environment Leader Effectiveness Personal Well-Being Job Satisfaction Morale	.74	.75

Table 6
Horizontal Cohesion Prediction Models at M4 and M5

Horizontal Cohesion Prediction Model	Significant Predictors	R^2 Based on First Two or Three Predictors	R^2 Based on Full Model
M4	Leader Effectiveness Personal Well-Being Learning Environment Attitude Toward Stability	.38	.38
M5	Learning Environment Personal Well-Being	.45	.45

Vertical cohesion. Although the predictive utility of leader effectiveness diminished from M4 to M5 in the case of the horizontal cohesion prediction model, that was not the case with the vertical cohesion model (Table 7), where leader effectiveness was the best predictor at both M4 and M5. The M4 and M5 vertical cohesion models were stable with respect to the first three predictors to enter the models. The same three variables entered both models and they entered in the same order.

Table 7
Vertical Cohesion Prediction Models at M4 and M5

Vertical Cohesion Prediction Model	Significant Predictors	R^2 Based on First Three Predictors	R^2 Based on Full Model
M4	Leader Effectiveness Learning Environment Personal Well-Being Attitude Toward Stability	.68	.68
M5	Leader Effectiveness Learning Environment Personal Well-Being	.73	.73

Organizational cohesion. For organizational cohesion, the most important predictor was learning environment. It was the first variable to enter the equation at both M4 and M5. Job motivation, morale, and leader effectiveness also entered both models, although their order of entry varied from M4 to M5 (see Table 8). Moreover, attitude toward stability entered the M4 but not the M5 model, and job satisfaction and personal well-being entered the M5, but not the M4, model. Though the M4 model contained five statistically significant predictors and the M5 model contained six predictors, in both cases the first three predictors formed parsimonious models, accounting for 97% of the total variance accounted for by the full predictive models.

Table 8
Organizational Cohesion Prediction Models at M4 and M5

Organizational Cohesion Prediction Model	Significant Predictors	R^2 Based on First Three Predictors	R^2 Based on Full Model
M4	Learning Environment Job Motivation Morale Leader Effectiveness Attitude Toward Stability	.64	.66
M5	Learning Environment Morale Leader Effectiveness Job Motivation Personal Well-Being Job Satisfaction	.69	.71

Horizontal vs. vertical vs. organizational cohesion. Leader effectiveness or learning environment entered prominently into every predictive model developed. For horizontal cohesion, leader effectiveness was the dominant variable at M4 and learning environment served this role at M5. For vertical cohesion, the top three predictors at M4 and M5 were invariant, as was their order of entry into their respective models, and in both cases leader effectiveness and learning environment were the first two predictors to enter. The organizational cohesion model was the most complex of the three, requiring 10 predictors to constitute two (M4 and M5) complete models (see Table 8) vs. only six and seven predictors, respectively, for horizontal and vertical models (see Tables 6 and 7, respectively). In both M4 and M5 organizational models, however, 97% of all variance accounted for by complete models could be attributed to the first three variables to enter the equations, and in both instances learning environment was the first predictor. Thus, organizational cohesion may be a more complex construct than horizontal or vertical cohesion, but the vast majority of its variance at either measurement occasion nonetheless was accounted for by a single predictor, learning environment. Leader effectiveness, which was so prominent in the vertical cohesion model (and in the M4 horizontal model) appeared in both organizational models, but only at fourth position in the M4 model and third position in the M5 model.

M4 to M5 model stability. The vertical cohesion prediction model was virtually invariant from M4 to M5. The same three predictors (leader effectiveness, learning environment and personal well-being) entered both models in precisely the same order, and the two models differed only in the addition of a fourth predictor at M5, a predictor that accounted for little incremental variance. Organizational cohesion required the most elaborate models, but both M4 and M5 models nonetheless contained four variables in common, including the same dominant predictor (learning environment) and three secondary predictors (job motivation, morale, and leader effectiveness). Horizontal cohesion seemed to be most affected by the transition from pre- to middeployment. Although the pre- and middeployment models shared two predictors, the dominant M4 predictor (leader effectiveness) dropped from the M5 model altogether and the dominant M5 predictor (learning environment) was only a third-place supporting contributor to the M4 model. Whereas four significant predictors entered the M4 model, the M5 version was formed by a parsimonious combination of two predictors, learning environment and personal well-being.

Changes in unit climate over time. Although all unit climate variables were related to (predictive of) cohesion at both M4 and M5, only leader effectiveness ratings dropped from one measurement period to the next, $F(1, 608) = 16.15$. This decrease was modest (i.e., from 3.6 to 3.5) but statistically reliable and present for both platoon leaders and members alike.

Question 3: What Impact Do Platoon Member and Platoon Leader Stability During Predeployment Have on Cohesion, Performance, Morale, and Unit/Army Commitment at Middeployment?

This question was asked to determine the validity of the Army's implicit assumption that predeployment (i.e., in garrison) platoon member and leader stability under UFS will have a subsequent positive impact on cohesion, performance, morale, and unit commitment during deployment.

Platoon Member Stability

Table 9 presents mean responses to a series of questions designed to assess the impact of prior platoon member stability on the above four areas of interest. Overall mean impact ratings ranged from 3.2 to 3.5 on a 5-point rating scale where 1 = "Very Negative Impact," 2 = "Somewhat Negative Impact," 3 = "No Impact," 4 = "Somewhat Positive Impact," and 5 = "Very Positive Impact." Thus, platoon member stability during predeployment was perceived to have a positive, albeit limited, impact on all four rating areas. The greatest reported impact was on personal performance (Q134), with a mean rating of 3.5, midway between "No Impact" and "Somewhat Positive Impact." Given that no data were available to support direct comparisons between the 172d SBCT (stabilized under UFS) and nonstabilized (IRS) units, the mean ratings for this series of questions were compared against a "No Impact" rating of 3.0 with a single-sample, two-tailed t test (Sprinthall, 2003, p. 171). The resulting $t(653)$ for the lowest overall mean (i.e., for platoon leaders and members combined) of 3.2 in Table 9 was 4.65, which exceeded the required t value of 2.56. Thus, all Table 9 overall means were statistically greater than 3.0, the rating value that would be expected if predeployment stability had no impact whatsoever.

Moreover, questions related to the above four areas were written in pairs, such that the first pair of questions assessed the impact of predeployment stability on personal morale (Q133) and on personal performance (Q134), the second pair assessed the impact on platoon morale (Q135) and on platoon performance (Q136), and so on. This pairwise construction permitted analysis of each pair of questions with a 2 (duty position; platoon leader, platoon member) $\times$ 2 (question; either first or second in each pair) mixed factorial ANOVA with one between (duty position) and one within (question) variable.

Analysis of the first pair of items (Q133 and 134) yielded a significant question main effect, $F(1, 654) = 82.81$, indicating that prior platoon member stability was perceived to have a greater mean impact on personal performance than on personal morale (3.5 vs. 3.2). Neither the duty position main effect nor the Duty Position $\times$ Question interaction was significant. For the second pair of questions, a significant question main effect was also found, with $F(1, 651) = 64.20$, indicating that prior platoon member stability was perceived to have a greater impact on platoon performance than on platoon morale. Again, neither the duty position main effect nor the Duty Position $\times$ Question interaction was significant. For the third pair of questions, a significant question main effect, $F(1, 651) = 51.11$, indicated that platoon member stability was perceived to have a greater impact on platoon cohesion than on platoon commitment to the 172d SBCT. A significant, $F(1, 651) = 14.18$ interaction between duty position and question also was found. Tukey's HSD tests indicated that, compared to platoon members, platoon leaders thought prior platoon member stability had produced a bigger impact on cohesion, whereas both groups gave statistically equivalent ratings in regard to commitment.

Table 9
Impact of Platoon Member Stability On Cohesion,
Performance, Morale, and Unit/Army Commitment

What impact have efforts to stabilize platoon members during predeployment had on each of the following at middeployment?	Overall			Platoon Leaders			Platoon Members		
	Mean	SD	n	Mean	SD	n	Mean	SD	n
Q133 My morale	3.2	1.1	656	3.1	1.1	325	3.2	1.1	331
Q134 My performance	3.5	0.9	656	3.5	0.8	325	3.5	0.9	331
Q135 Platoon morale	3.2	1.0	653	3.2	1.0	323	3.2	1.0	330
Q136 Platoon performance	3.4	0.9	653	3.4	0.9	323	3.5	0.9	330
Q137 Platoon cohesion	3.4	1.1	653	3.5	0.9	323	3.3	0.9	330
Q138 Platoon commitment	3.2	1.1	653	3.1	1.1	323	3.2	1.1	330

Platoon Leader Stability

Table 10 presents mean responses to the questions designed to assess the impact of prior platoon leader stability on the four aforementioned areas of interest. The overall mean ratings ranged from 3.2 to 3.4, again indicating that platoon leader stability was perceived to have a moderately positive impact (i.e., relative to the “No-Impact” rating value of 3.0). Additionally, each pair of questions in Table 10 was analyzed with a 2 (duty position; platoon leader, platoon member) x 2 (question; either first or second question of each pair) factorial ANOVA with one between (duty position) and one within (question) variable. The only significant result was a question main effect on the first pair of items, $F(1, 627) = 30.48$, indicating that platoon leader stability was perceived by both leaders and members to have a greater impact on personal performance than on personal morale. There were no duty position main effects or Duty Position x Question interactions on any of the item pairs.

Thus, both platoon member stability and platoon leader stability during predeployment were associated with moderately elevated middeployment ratings (ranging from 3.2 to 3.5) on cohesion, performance, morale, and unit commitment relative to a “No Impact” rating of 3.0. Both platoon member and platoon leader stability had more impact on personal performance than on personal morale. Moreover, platoon member stability had more impact on platoon performance than on platoon morale. And finally, platoon member stability had greater perceived impact on platoon cohesion than on platoon commitment.

Table 10
Impact of Platoon Leader Stability On Cohesion,
Performance, Morale, and Unit/Army Commitment

What impact have efforts to stabilize platoon leaders during predeployment had on each of the following at middeployment?	Overall			Platoon Leaders			Platoon Members		
	Mean	SD	n	Mean	SD	n	Mean	SD	n
Q139 My morale	3.2	0.9	629	3.2	0.9	311	3.2	1.0	318
Q140 My performance	3.4	0.8	629	3.4	0.8	311	3.3	0.9	318
Q141 Platoon leader morale	3.3	0.9	626	3.3	0.9	310	3.3	0.8	316
Q142 Platoon leader performance	3.3	0.9	626	3.3	0.9	310	3.3	0.9	316
Q143 Platoon leader cohesion	3.3	0.8	627	3.3	0.8	310	3.3	0.9	317
Q144 Plt ldr and member cohesion	3.3	0.9	627	3.3	0.9	310	3.3	0.8	317
Q145 Plt and Co Ldr cohesion	3.3	0.8	623	3.3	0.8	310	3.3	0.8	313
Q146 Platoon leader commitment	3.3	0.9	623	3.2	0.9	310	3.3	0.8	313

Question 4: What Impact Does Predeployment Training at JRTC Have on Middeployment Platoon Performance?

The impact of predeployment JRTC training was assessed with the questions listed in Table 11, using the same 5-point rating scale described above. Mean overall ratings ranged from 3.2 to 3.3, indicating moderately positive impact (significantly higher than the No-Impact rating of 3.00) of JRTC training on personal, platoon, and platoon leader performance at middeployment. The trio of related Table 11 questions was analyzed using a 2 (duty position; platoon leader, platoon member) x 3 (question; Q147-149) mixed factorial ANOVA with one between (duty position) and one within (question) variable, but this analysis produced no significant results. Thus, all three performance dimensions were judged to have benefited somewhat from JRTC training.

Table 11
Impact of JRTC Training on Performance

What impact has predeployment training at JRTC had on each of the following at middeployment?	Overall			Platoon Leaders			Platoon Members		
	Mean	SD	n	Mean	SD	n	Mean	SD	n
Q147 My performance	3.2	1.0	645	3.2	1.0	322	3.3	1.0	323
Q148 Platoon performance	3.3	1.0	645	3.3	1.0	322	3.3	1.0	323
Q149 Platoon leader performance	3.3	1.0	645	3.3	1.0	322	3.3	1.0	323

Last page comments

The last page of each questionnaire invited respondents to comment on issues of concern to them or to their families. Table 12 presents the ten most frequently mentioned concerns at M4 and M5 questionnaire administrations. The participation rate (that is, the percentage of Soldiers

who wrote comments) at M5 decreased by half vs. the rate observed at M4, possibly reflecting the general challenge of completing questionnaires in a combat environment. At M4, 383 Soldiers (14.8% of those assessed) submitted written comments. At M5, 145 Soldiers (7.4% of those assessed) submitted comments. Nonetheless, the two lists shared seven common concerns. The three areas of concern that appeared at M4, but not at M5, were mission readiness, medical care, and equipment. As can be seen in Table 12, these M4 concerns trailed the list of most frequently cited problems and were replaced at M5 by concerns with redeployment, family and personal time, and concerns that the unit was under strength. Redeployment comments focused on the unit's uncertain fate once it returned to Alaska, that is, exactly where some units within the brigade would be stationed. Concerns with family and inability to spend time with loved ones undoubtedly related to how long the unit had already been in country at the time of M5 assessment (about 6 months). The third concern to appear for the first time at M5 was that of personnel strength. In fact, this concern had surfaced earlier at M4, but only in interviews with unit first sergeants. For the first time at M5, however, concerns about personnel shortages were expressed via questionnaire comments.

Table 12
Most Frequently Cited Issues of Concern (n)

M4 383 Soldiers 2,586 Questionnaires	M5 145 Soldiers 1,967 Questionnaires
Training (73)	Leadership (36)
Respect Issues (62)	Redeployment (29)
Career Development (52)	Career Development (25)
Leadership (40)	Family/Personal Time (21)
Housing (26)	Respect Issues (21)
Morale (25)	Training (15)
Long Work Hours (20)	Morale (10)
Mission Readiness (17)	Long Work Hours (10)
Poor Medical Care (17)	Housing (7)
Equipment (16)	Under Strength (5)

Although seven concerns were mentioned in common from M4 to M5, these concerns underwent substantial reshuffling in terms of their relative frequency of mention. Training was the most discussed concern at M4, but it dropped to sixth place at M5. Other concerns that diminished in relative importance were respect issues and housing. Concern over the potential negative impact UFS might have on career development was the third most salient concern at both M4 and M5. Only the concern over leadership grew markedly in relative importance from M4 to M5, rising from the fourth most frequently cited concern at M4 to the number one concern at M5. This rise prompted an examination of M1-M3 written comments (Smith & Hagman, in publication) in order to determine this concern's relative frequency of mention on earlier occasions. Leadership concerns ranked fifth, fourth, and fifth, respectively, at M1-M3. Thus, the jump to the number one concern at M5 was without precedent.

At M5, respondents complained that leaders were (listed in order of frequency of mention): (a) unhelpful/unconcerned/uncaring/uninformed, (b) of generally poor quality, (c) obsessed with

their own career/image, (d) too numerous, (e) prone to micromanage, and (f) inexperienced or incompetent. An examination of previously obtained M1-M4 comments revealed these same subcategories. Soldiers expressed the same concerns at M5 as they had expressed earlier during the garrison phase of the 172d SBCT's lifecycle. What changed at M5 was that leadership concerns rose from fourth or first place to become the most salient concern of Soldiers during middeployment.

Discussion

The present research extended ARI's on-going longitudinal assessment of the lifecycle impact of UFS manning on cohesion to include the time interval between 172d SBCT pre- and middeployment. In doing so, answers to four specific questions were sought. The answer to each is provided and discussed in turn below. Given that the lack of control and the frequent reliance on correlational data prevent definitive cause and effect conclusions, the interpretation of results provided herein are to be considered speculative.

Question 1: How Does Cohesion Change From Pre- to Middeployment?

Answer 1: Horizontal cohesion remained stable from pre-to middeployment, whereas vertical and organizational cohesion showed a small but statistically significant drop.

Consistent with past findings reported for units stabilized under Project COHORT (e.g., Thurman, 1989), results from the earlier garrison phase of this longitudinal assessment showed that cohesion generally dropped monotonically over time from M1 to M4 and that the drop for horizontal cohesion was less than that found for vertical and organizational cohesion (Smith & Hagman, in publication). The present assessment revealed that horizontal cohesion remained stable at moderate levels, whereas vertical and organizational cohesion continued to drop, from pre- to middeployment. (i.e., M4 to M5). Given that cohesion is thought to sustain individuals and groups under times of stress (e.g., Griffith & Viatkus, 1999; Shils & Janowitz, 1948), the hardships imposed by deployment to a combat zone are likely to have solidified horizontal cohesion (i.e., peer bonding) during this phase of the 172d SBCT's operational lifecycle, in much the same way as combat hardships in other contexts have been linked to enhanced cohesion (e.g., Ambrose, 2001).

The drop in vertical cohesion, however, revealed that the bond between Soldiers and leaders continued to deteriorate between pre- and middeployment. More than likely, this continued drop was the result of Soldier-perceived leadership inadequacies, as evidenced by the concomitant drop in leadership effectiveness ratings from M4 to M5 and the increased prominence of written complaints about leaders at M5. Presumably, leader effectiveness undergoes continual reappraisal by Soldiers, especially once deployed and the consequences of ineffective leadership are amplified from garrison levels. In addition, leader deficiencies may also become more pronounced and less tolerable when Soldiers' lives are on the line. Thus, bonding between Soldiers and leaders (and vice versa) is likely to have weakened during deployment as additional leader deficiencies were identified. In addition, it could be argued that stability places greater demands on leaders to implement more progressive/accretive mission-oriented training over time (Towell, 2004). Presumably, these demands increase significantly in a combat environment and

failure to meet them is likely to have a greater negative impact on the establishment and maintenance of bonds between Soldiers and their leaders. In either case, the disparity between horizontal and vertical cohesion, in favor of the former, reveals that Soldiers were bonding with each other but not with their leaders. Since vertical cohesion is thought to be an effective predictor of performance and the “glue” that keeps Soldiers going and performing well in extreme circumstances (Spiegel, 1944), such disparity is not conducive to enhanced teamwork and associated mission performance (e.g., Alderks, 1992; Etzioni, 1975; James, et. al., 1983; Noy, 1987) and, thus, should be a target for Army remediation.

Organizational cohesion also dropped from pre- to middeployment. Apparently, Soldiers were either unwilling or unable to distinguish between their leaders and their units or the Army in general, given that leaders are the most immediate representatives of each. As a result, both organizational and vertical cohesion continued to drop over time. So along with blaming their leaders, Soldiers also blamed their units and the Army for perceived inadequacies, as evidenced by written complaints on the last page of the questionnaire regarding personnel shortages, unavailability of postdeployment plans, the need to work long hours, extended time away from home, and family care concerns. Indeed, such complaints may underlie the perception that the unit and the Army are not doing the best that they can do for Soldiers (and their families) in return for services rendered during middeployment. This perception could jeopardize not only attainment of immediate unit/Army objectives, but also military commitment and associated future reenlistment intentions (e.g., Oliver, et. al., 1999).

Overall, it can be concluded that the above cohesion-related findings are consistent with those reported under Project COHORT (e.g., Furukawa, et. al., 1987). As such, they underscore the past conclusion of others (e.g., Scull, 1990; Thurman, 1989; Towell, 2004) that keeping Soldiers together in the same unit for a protracted period of time (e.g., under UFS) is insufficient to enhance cohesion. The answer to the next question provides some insight into how cohesion might be enhanced within a UFS environment.

Question 2: What Variables Are Related to (Are Predictive Of) Cohesion At Pre- And Mid-Deployment?

Answer 2: Unit climate variables were related to cohesion; Soldier demographic variables were not, or at least not to the same degree as the former. In general, cohesion was best predicted on the basis of the unit climate variables of leader effectiveness and learning environment.

All measured unit climate variables were positively related to overall cohesion and its three dimensions, especially vertical and organizational cohesion, with correlations falling in the moderate to high range for leader effectiveness, learning environment, job satisfaction and motivation, personal well-being, and morale. Thus, for example, the more leaders were viewed as effective (e.g., the more they looked out for the welfare of their Soldiers and their families, encouraged teamwork, were friendly, approachable, and respectful of others, knew Army doctrine and tactics, maintained high standards for unit performance, and kept subordinates informed), or the more the unit environment was seen as learning conducive (e.g., Soldiers were given responsibility for their work, were encouraged to do things on their own even if they made

mistakes, were provided with sufficient access to career development activities/opportunities, and were the source of leader confidence), the higher cohesion was reported to be. Demographic variables (e.g., age, unit, and time in service), in contrast, held little associative value with cohesion (Siebold & Lindsey; 1999). Although correlation does not necessarily imply causation, these results at least suggest that future Army interventions (e.g., training) designed to promote cohesion in a stabilized environment might best be targeted at unit climate variables in order to achieve maximum payoff.

Just which specific unit climate variables to target was determined through use of stepwise multiple regression. Results revealed that the best models for predicting overall cohesion, as well as its three dimensions, from pre- to middeployment consistently included leader effectiveness and learning environment. Learning environment appeared in all eight predictive models while leader effectiveness appeared in seven of the eight and both these variables tended to enter the prediction equations early and, therefore, had the greatest predictive utility. Thus, future efforts to enhance these two aspects of unit climate are likely to have a positive impact on cohesion. Based on order of entry into the predictive regression models, leader effectiveness enhancements are likely to have a greater impact on vertical and organizational cohesion, whereas learning environment enhancements are likely to have a greater impact on horizontal cohesion. Furthermore, because both leader effectiveness and learning environment were found to be important and stable predictors of cohesion over time (i.e., at both M4 and M5), targeted interventions designed to enhance either area are likely to be beneficial anytime they are introduced during the pre- and middeployment phases of a stabilized unit's lifecycle.

Because the notion that leader effectiveness and learning environment are the keys to strong unit cohesion is not new (e.g., Bartone & Adler, 1999; Bartone & Kirkland, 1991; Gal, 1986; Henderson, 1985; Siebold & Lindsay, 1999), there is no shortage of associated recommendations on how each can be enhanced to promote cohesion. Thurman (1989) and Towell (2004), for example, have suggested that to be effective in stabilized units leaders need to be readily capable of taking advantage of accretive/progressive training opportunities created by having the same Soldiers together for prolonged periods of time. Without such training, cohesion is likely to drop because Soldiers increasingly perceive that they are not fully using their skills, fulfilling their developmental needs, or preparing for missions as important or meaningful as once thought. Others have gone on to suggest that leaders can effectively promote a positive learning environment in a variety of ways (e.g., Headquarters, Department of the Army, 1999; Henderson, 1985; Johns, 1984; McDonald, 1994; Siebold, 1989). Siebold (1989), for example, suggests that leaders can do so by providing Soldiers with guidance and direction when assigning new duties, encouraging them to act on their own without fear of mistakes, providing challenging, mission-relevant training, keeping standards high, recognizing good performance, developing subordinates, opening communication channels, administering needed discipline, and acting as a positive role model. Adherence to these suggestions should produce more effective leaders, a better learning environment for Soldiers, and higher levels of cohesion.

Question 3: What Impact Do Platoon Member and Platoon Leader Stability During Pre-Deployment Have on Cohesion, Performance, Morale, and Unit/Army Commitment at Middeployment?

Answer 3: Stabilizing platoon members and leaders during predeployment was perceived at middeployment to have a moderately positive impact on each of the four assessed areas.

The impact of predeployment efforts to stabilize platoon leaders and members was positive in all four areas questioned. In addition, platoon member stability had a greater impact on personal performance than on morale, a greater impact on platoon performance than on platoon morale, and a greater impact on platoon cohesion than on platoon commitment to the 172d SBCT. Similarly, platoon leader stability was perceived to have had a greater impact on personal performance than on morale. For the most part, platoon leaders and members gave similar ratings, except in one area where the former thought platoon member stability had produced a greater impact on unit cohesion. Of the four areas assessed, the greatest impact of predeployment stability was perceived to be on performance, with a mean rating midway between "No Impact" and "Somewhat Positive Impact."

Although it one could argued that it is difficult for questionnaire respondents to attribute middeployment levels of any of the four rated areas to enhanced stability that took place in garrison at least 6 months earlier during predeployment, their responses are at least in line with Army expectations that stability under UFS will have broad-based benefits, especially in regard to small-unit individual and collective performance. Of course, more rigorous research is needed to determine the validity of this notion. If validated, however, performance benefits brought about through heightened stability should also translate into higher levels of cohesion, and vice versa (e.g., Mullen & Copper, 1994).

Question 4: What Impact Does Predeployment Training at JRTC Have on Middeployment Platoon Performance?

Answer 4: Predeployment training at JRTC was perceived to have positively impacted Soldier, platoon leader, and platoon performance.

One of the primary objectives of JRTC-based training is to enhance postdeployment operational effectiveness by preparing Soldiers and their leaders for missions to be conducted and the conditions to be encountered once units are deployed. Answers to questions asked in the present, as well the earlier (Smith & Hagman, in publication), phase of this assessment indicate that this objective was generally met for the 172d SBCT in regard to platoon-level preparation, despite a handful of written comments on the questionnaires to the contrary. These results support the Army's expectation that JRTC-based training during predeployment will enhance the performance of small units once deployed.

Conclusions and Future Directions

To the extent that the current findings from the 172d SBCT, and supporting evidence cited from other sources, generalize to other UFS-manned units, the Army can be reasonably confident that (a) heightened personnel stability under UFS will not by itself increase from unit pre- to middeployment, and (b) without a concerted effort to promote effective leadership and a positive learning environment for Soldiers, horizontal cohesion is unlikely to change from pre- to

middeployment, whereas vertical and organizational cohesion are likely to drop. Additional findings can be taken to suggest that heightened personnel stability under UFS, as well as JRTC-based training, during predeployment are likely to benefit small-unit individual and collective performance, at least during the first 6 months of deployment.

The next, and final, phase of this longitudinal assessment program will extend analysis to include information collected shortly after return/redeployment of the 172d SBCT to home station in Alaska. Using pre- (M4) and middeployment (M5) data as the bases for comparison, any changes in cohesion that occur over the final 6 months of the 172d SBCT's lifecycle will be tracked, variables that enhance or detract from these changes will be identified, and lessons learned for improving future UFS implementation will be documented.

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Appendix A

Cohesion Prediction Models

Using iterative stepwise multiple regression routines, prediction models were developed for overall, horizontal, vertical, and organizational cohesion at both M4 and M5, creating a total of 8 models. Variables used in constructing these models included all unit climate or demographic variables with a significant relation to the criterion. Relatively complete data were available on all predictors except one: the family well-being scale. This state of missing data came about because family well-being items were asked only of respondents with direct knowledge of the relevant issues (e.g., spousal employment, childcare, and nongovernment housing). Since many combat arms members were young, unmarried males, a low proportion of them completed this section of the questionnaire.

SPSS multiple regression routines handle missing data in a variety of ways. The most common method is list-wise deletion of records with missing data. That is, if a respondent has missing data on any predictor, all of that respondent's data are eliminated from the analysis. When family well-being data were made available as predictors, as many as 50% of Soldiers (those who had not completed the family well-being section of the questionnaire) were eliminated.

Thus, analyses could be based on the broadest base of available Soldiers by withholding one predictor (family well-being) or on the broadest base of predictor items by elimination as many as half the Soldiers. The dilemma was resolved by conducting analyses both ways. First, the family well-being predictor was withheld and models were developed using the broadest base of available Soldiers. Then, family well-being was added to the pool of potential predictors and the models were redeveloped with a substantially reduced based of Soldiers.

Prediction models from both models were highly comparable. Importantly, the family well-being predictor was not selected for inclusion in any model even when it was made available. In the following, therefore, only the first approach, which omitted the family well-being unit climate variable, but included data from all eligible respondents, is reported.

M4 Overall Cohesion Prediction Model.

Five M1 predictors entered the equation before the iterative stepwise process terminated. Variables are listed in Table A-1 in the order they entered the prediction model. All listed variables significantly enhanced the model, but leader effectiveness was the dominant predictor, entering the equation first and accounting for 88.4% ($.61/.69 = 88.4\%$) of all variance in the full 5-predictor model. The first three variables (leader effectiveness, learning environment, and job motivation) to enter the overall cohesion M4 equation formed a parsimonious model, accounting for 98.6% of all variance in the full five-predictor model.

Table A-1
M4 Overall Cohesion Prediction Model ($n = 530$)

Predictor Variable	R	R^2	R^2 Change	F Change	Unstand- ardized B	Standar- dized B
Leader Effectiveness	.78	.61	.61	825.24	.29	.34
Learning Environment	.81	.66	.05	68.31	.29	.31
Job Motivation	.82	.68	.02	39.27	.20	.16
Stabilization Attitudes	.83	.69	.01	15.42	.06	.09
Personal Well-Being	.83	.69	.01	8.66	.10	.10
Intercept = 0.28						

M5 Overall Cohesion Prediction Model

Variables made available to the M5 prediction model consisted of all unit climate variables (except family well-being), and four demographic variables (expected years of service, rank, duty position, and paygrade) with significant zero-order correlations with the M5 cohesion criterion. For the M5 model, five unit climate variables entered the equation before the iterative stepwise process terminated. All statistically significant predictors are listed in Table A-2 in the order they entered the equation. The top two variables were unchanged from the M4 model and these two predictors accounted for 96.0 % of all variance accounted for the full five-predictor model.

Table A-2
M5 Overall Cohesion Prediction Model ($n = 552$)

Predictor Variable	R	R^2	R^2 Change	F Change	Unstand- ardized B	Standar- dized B
Learning Environment	.82	.67	.67	1120.01	.32	.33
Leader Effectiveness	.85	.72	.05	92.62	.31	.36
Personal Well-Being	.86	.74	.02	38.48	.11	.11
Job Satisfaction	.86	.74	.01	13.66	.08	.09
Morale	.86	.75	.00	4.99	.05	.07
Intercept = 0.30						

Horizontal, Vertical, and Organizational Prediction Models

Specifications for each of the six remaining predictive models (i.e., two each for horizontal, vertical, and organizational cohesion) are listed below in Tables A-3 through A-8.

Table A-3
M4 Horizontal Cohesion Prediction Model ($n = 588$)

Predictor Variable	R	R^2	R^2 Change	F Change	Unstand- ardized B	Standar- dized B
Leader Effectiveness	.58	.34	.34	296.11	.24	.27
Personal Well-Being	.60	.37	.03	26.93	.17	.17
Learning Environment	.61	.38	.01	11.00	.22	.22
Stabilization Attitudes	.62	.38	.00	4.05	.05	.07
Intercept = 1.33						

Table A-4
M5 Horizontal Cohesion Prediction Model ($n = 555$)

Predictor Variable	R	R^2	R^2 Change	F Change	Unstand- ardized B	Standar- dized B
Learning Environment	.66	.44	.44	429.15	.59	.58
Personal Well-Being	.67	.45	.01	9.62	.13	.13
Intercept = 0.89						

Table A-5
M4 Vertical Cohesion Prediction Model ($n = 530$)

Predictor Variable	R	R^2	R^2 Change	F Change	Unstand- ardized B	Standar- dized B
Leader Effectiveness	.81	.66	.66	1020.97	.59	.59
Learning Environment	.82	.67	.01	18.23	.20	.18
Personal Well-Being	.82	.68	.01	10.20	.11	.10
Stabilization Attitudes	.83	.68	.00	5.03	.05	.06
Intercept = 0.27						

Table A-6
M5 Vertical Cohesion Prediction Model ($n = 552$)

Predictor Variable	R	R^2	R^2 Change	F Change	Unstand- ardized B	Standar- dized B
Leader Effectiveness	.84	.71	.71	1356.74	.64	.63
Learning Environment	.85	.73	.01	27.07	.20	.18
Personal Well-Being	.86	.73	.01	13.06	.12	.10
Intercept = 0.22						

Table A-7
M4 Organizational Cohesion Prediction Model ($n = 530$)

Predictor Variable	R	R^2	R^2 Change	F Change	Unstand- ardized B	Standar- dized B
Learning Environment	.76	.58	.58	718.07	.35	.34
Job Motivation	.79	.63	.05	68.16	.27	.21
Morale	.80	.64	.02	28.10	.10	.14
Leader Effectiveness	.81	.66	.01	21.59	.20	.22
Stabilization Attitudes	.82	.66	.01	9.65	.06	.08
Intercept = 0.16						

Table A-8
M5 Organizational Cohesion Prediction Model ($n = 552$)

Predictor Variable	R	R^2	R^2 Change	F Change	Unstand- ardized B	Standar- dized B
Learning Environment	.79	.62	.62	891.61	.29	.28
Morale	.81	.66	.04	72.11	.08	.13
Leader Effectiveness	.83	.69	.03	43.96	.25	.28
Job Motivation	.84	.70	.01	21.45	.12	.10
Personal Well-Being	.84	.70	.01	8.46	.10	.10
Job Satisfaction	.84	.71	.00	4.06	.07	.08
Intercept = -0.26						