NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

A VALIDITY REVIEW OF THE COLOR COMPANY COMPETITION AT THE UNITED STATES NAVAL ACADEMY

by

Derek S. Dryden

June 2006

Thesis Co-Advisors: Armando Estrada
Kurtis Swope

Approved for public release; distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.			
1. AGENCY USE ONLY ***(Leave blank)***	**2. REPORT DATE** June 2006	**3. REPORT TYPE AND DATES COVERED** Master's Thesis	
4. TITLE AND SUBTITLE: A Validity Review of the Color Company Competition at the United States Naval Academy			**5. FUNDING NUMBERS**
6. AUTHOR(S) Lieutenant Derek S. Dryden			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			**8. PERFORMING ORGANIZATION REPORT NUMBER**
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			**10. SPONSORING/MONITORING AGENCY REPORT NUMBER**
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			**12b. DISTRIBUTION CODE**

13. ABSTRACT

As the primary source of officers for the Navy and Marine Corps team, the Naval Academy's reputation is marked by the quality of its graduates. At the United States Naval Academy, the Color Company Competition annually honors the highest performing company within the Brigade of Midshipmen. This competition includes measures of academic, athletic and professional measures of performance.

Using data obtained through the Institutional Research Department, the Physical Education Department, as well as the Activities and Operations Offices, this study examines the validity of the current performance measurement tool at the Academy. Through the use of linear regression models, this study found that the current procedures do meet the intent of published guidance but that those procedures require revision and updating.

Conclusions and recommendations for future improvement are provided at the completion of the study. Included as a recommendation is a proposed program combining both the Color Company Competition and the Company Incentive Program. This program and other initiatives are intended to intensify the Naval Academy's focus on fostering esprit de corps and improving the development of midshipmen.

14. SUBJECT TERMS Performance Measurement, Motivation, Incentive Program, Program Analysis, U.S. Naval Academy, Color Company Competition, Team Performance			**15. NUMBER OF PAGES** 99
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	**18. SECURITY CLASSIFICATION OF THIS PAGE** Unclassified	**19. SECURITY CLASSIFICATION OF ABSTRACT** Unclassified	**20. LIMITATION OF ABSTRACT** UL

NSN 7540-01-280-5500 Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited

A VALIDITY REVIEW OF THE COLOR COMPANY COMPETITION AT THE UNITED STATES NAVAL ACADEMY

Derek S. Dryden
Lieutenant, United States Navy
B.S., United States Naval Academy, 2000

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN LEADERSHIP AND HUMAN RESOURCES DEVELOPMENT

from the

NAVAL POSTGRADUATE SCHOOL
June 2006

Author: Derek S. Dryden

Approved by: Armando Estrada
Thesis Co-Advisor

Kurtis Swope
Thesis Co-Advisor

Robert N. Beck
Dean, Graduate School of
Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

As the primary source of officers for the Navy and Marine Corps team, the Naval Academy's reputation is marked by the quality of its graduates. At the United States Naval Academy, the Color Company Competition annually honors the highest performing company within the Brigade of Midshipmen. This competition includes measures of academic, athletic and professional measures of performance.

Using data obtained through the Institutional Research Department, the Physical Education Department, as well as the Activities and Operations Offices, this study examines the validity of the current performance measurement tool at the Academy. Through the use of linear regression models, this study found that the current procedures do meet the intent of published guidance but that those procedures require revision and updating.

Conclusions and recommendations for future improvement are provided at the completion of the study. Included as a recommendation is a proposed program combining both the Color Company Competition and the Company Incentive Program. This program and other initiatives are intended to intensify the Naval Academy's focus on fostering esprit de corps and improving the development of midshipmen.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

First, I have to thank God for allowing me all of the opportunities I have had throughout my naval career and life. I am very grateful for having had the opportunity to spend time with family and friends while continuing my education.

I would like to thank my wife Joy for the love, support, and encouragement she provided me during this project. She took on the difficult chore of keeping me on track while maintaining the household running smoothly and efficiently.

I would also like to acknowledge the support and guidance I received throughout this study from my thesis advisors, Dr. Armando Estrada and Dr. Kurtis Swope. These two individuals definitely came together with their expertise to help turn this into a fine group effort.

Additionally, I am grateful to the support I received from the Naval Academy's Institutional Research Department and especially to Dr. Linda Mallory and Cathy Morgan.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

A. BACKGROUND

For over a century, the United States Naval Academy (USNA) has taken capable young men and women from across the country and developed them into naval officers. Over that time, the Academy has shifted from merely a maritime 'trade school' to become a highly esteemed academic institution receiving high marks nationally in various reviews (Rogers, 2003). Furthermore, the Academy participates in numerous NCAA Division I sports and has a copious intramural program allowing every student the opportunity for competition and physical development. A focus on striving for success and improvement are designed into the Naval Academy's well-rounded education.

The midshipmen attending the Academy come from superb backgrounds noting the exceptional nature of the entrants: Math and Verbal SAT scores averaging higher than 600, high school class standing typically in the top 20%, a significant percentage (greater than 85% on average) of applicants were high school varsity athletes, as well as participation in several other extracurricular activities. Immersion in the 'leadership laboratory' helps successfully transfer these young and highly capable civilian students into capable Navy and Marine Corps officers.

The institution has based the four years of undergraduate education of these future leaders upon its mission statement:

> To develop midshipmen morally, mentally and physically and to imbue them with the highest ideals of duty, honor and loyalty in order to provide graduates who are dedicated to a career

> of naval service and have potential for future development in mind and character to assume the highest responsibilities of command, citizenship, and government (USNA, 2006)

As the premier source of U.S. Navy and Marine Corps Officers, the Naval Academy is also continually trying to improve upon its successes. The Academy, along with input from entities such as alumni, faculty, and the Board of Visitors, has established a Strategic Plan in hopes to better guide the institution during the twenty-first century (USNA, 2006). Some of the components involved in this plan include:

- To provide the finest leadership development program in the nation;
- To set the national standard for the development of moral and ethical leaders;
- To provide exemplary programs of athletic competition and physical challenge.

Evaluation of the exceptionally-able students' overall performance as midshipmen must therefore include measures of moral, mental and physical development as well as measures of military professionalism. This performance, though typically achieved and measured individually, must be additionally analyzed on a company level. Company-based measurement is useful because the requirements for teamwork and cooperation transfer to the fleet where graduates will serve. The Brigade, comprising thirty companies, and its success is largely dependent upon the cohesion and accomplishment of each company.

Human performance technology (HPT) professionals primarily focus on performance and, more explicitly its measurement and improvement. The principal intention of

this practice “is to produce desirable results that are valuable to both the organization and the organization’s employees by implementing effective and efficient interventions (Chyung, 2005, p. 23).” These professional researchers have postulated that output performance of teams is dependent upon both extrinsic as well as intrinsic inputs. The inputs include incentives and motivation, teamwork, cohesion, and morale; all constructs that are expressly reviewed within this study.

The Performance and Activities Offices have developed a statistic-based formula to evaluate performance of a company of midshipmen. The individual statistics are modified by different coefficients that are purported to account for the overall importance to performance. The output of the equation is a tally of ’color points’ by which each of the thirty companies is ranked. The company with the most points at the end of the year and, thus, ranked as number-one earns recognition as the Color Company.

B. PURPOSE

The formula for success that dictates the Color Competition has never been objectively analyzed. While the intent of the program, “to stimulate ... development of midshipmen” (USNA, 2001), seems intuitively positive, however, it is important to verify the successful implementation of the program. Moreover, a thorough understanding of the measures in place will prove constructive to program managers and the Naval Academy’s administrators. This type of feedback is one of the most fundamental aspects of performance improvement (Stolovitch, 2000).

Also, the weight of each individual measurement was initially developed without reflection on the relative importance of these dimensions. Therefore, validation of this measuring tool is needed. The purpose of the present study is to examine the validity of the scoring algorithm utilized for determining performance in the Color Company Competition.

Beyond simple evaluation of the performance measurement procedures used during the Color Company Competition, the following research questions will be answered:

1. **Primary Research Question:**

   - What is the predictive validity of the algorithm used to select Color Company?

2. **Secondary Research Questions:**

   - Should professional, athletic, and academic development be equally weighted in the selection of color companies?
   - Does the reward system currently in place provide effective motivation for companies to strive for Color Company status?
   - Is there a way to combine an incentive program that is currently in place with the Color Company Competition effectively, creating a tangibly relevant measurement tool?

C. STUDY HYPOTHESES

The effective evaluation of the performance measures currently in-place at the Naval Academy requires establishing hypotheses for testing. The hypotheses will

be centered around the primary focus of this research project, the validity review of the Color Company Competition.

1. Null Hypothesis:

The procedures that are currently being used at the Naval Academy are valid and adequately measure desired performance levels.

H_o = analysis will provide evidence of algorithm's validity

2. Alternate Hypothesis:

The procedures utilized as competition parameters will be determined to be invalid and inappropriate as a performance management tool.

H_a = analysis will not provide evidence of algorithm's validity

D. SCOPE

The scope of this project includes: (1) a review of the Color Company Competition process, (2) a review of performance measurement models, and (3) a review of measures of success at the Naval Academy. These reviews include discussions on teams and teamwork, motivation and incentives, and morale and cohesion as they relate to performance.

This study uses data from all classes of midshipmen attending the Academy during the academic years of 2001 through 2005. The data includes measures of academic, athletic, and professional performance. Additional data from the Naval Academy's 2005 Brigade Climate Survey is utilized to assist the administration gauge the morale climate within each individual company in comparison with

the rest of the Brigade. Select questions were chosen from the fifty-six question survey based upon expected relevance to this study according to the constructs of teamwork, leadership, and morale.

E. LIMITATIONS AND ASSUMPTIONS

Little historical data has been maintained throughout the years for use in this study. Data collection appears to not be a problem for the Academy, however, appropriate central control of compiled data does not appear to exist. Therefore, this study has focused a great deal of emphasis upon the most recent results of the Color Company Competition (Academic Year 2005) in order to determine the validity of the process itself, establish conclusions, and develop recommendations for future improvements to the process.

Confounding problems to this study also include the possibility that each company's 'challenges' and stresses are not equal. Each company consists of midshipmen who have selected varying majors of varying difficulty. Individuals involved in engineering majors (Group I) theoretically consume more time and effort academically than do individuals who are humanities and social sciences majors (Group III). Previous college or military experience may also affect the results of the study. The assumption used for this study is that each company consists of equal percentages of major selections, prior 'experiences', gender and ethnicity based upon the overall demographics of the institution.

Multicollinearity between questions chosen from the Brigade Climate survey, an appraisal of company morale conducted during the 2005 academic year, could lead to

misleading results during this study's analysis. Multicollinearity occurs when two independent variables within a regression analysis are so intimately linked that they may convey redundant information. The nature of the survey itself as well as the specific questions selected for this study exposes a concern for multicollinearity. This concern can not simply be removed by using different questions or by statistically manipulating the climate results. Through careful analysis, awareness as to the possible existence of multicollinearity will reduce any negative effects.

A final dilemma involved in this study includes the inadequacy of the direction provided by the institution itself. The current guidance, in the form of a Commandant of Midshipmen Instruction (USNA, 2001), has not been updated for several years and includes certain measures that no longer exist (wargaming exercises) or that are no longer utilized (i.e. military academic courses account only in academic measure, not in professional). Furthermore, the most recent competition (AY2005) includes two Company Assessment Program (CAP) rankings whereas the instruction directs that only one ranking be used.

F. ORGANIZATION OF STUDY

Chapter I consists of an introduction to this study. This introduction includes the study's background, purpose, scope, methodology, and organization of study. Overall, the introduction chapter introduces the Naval Academy's mission, the Color Company Competition, and the importance of accurately measuring successful performance.

Chapter II presents a review of the current literature relevant to this study. The section details further

specifics of the Color Company Competition and Company Incentive Program at the Naval Academy. This chapter explains various possible performance measurement models and their individual benefits. Additionally, this chapter will look deeply into specific tenets of the Naval Academy's mission including the military constituent that separates this military institution from other academic forums.

Chapter III includes an in-depth discussion of the research methodology including sources of quantitative data, data descriptions, and the data manipulation techniques employed.

Chapter IV encompasses the analysis of the data and results of the regression models. This chapter also details an analysis of company performance during the award period (time the Color Company benefits from the privileges of their success). Finally, Brigade Climate Survey data is reviewed to determine what, if any, effects on company performance are observed from selected climate-related issues.

The final chapter, Chapter V, begins by summarizing the previous chapters of the study. In addition, this chapter includes a synopsis of the study's conclusions and provides recommendations that developed during the course of this study.

II. LITERATURE REVIEW

A. INTRODUCTION

The performance of midshipmen has been shown as directly related to their performance as a naval officer (Evans, 2002; Robbins, 2004). This fact makes it imperative for the Naval Academy to effectively measure midshipmen performance and ensure that that performance meets specific standards. Organizations that do not effectively evaluate performance can not begin to determine the effectiveness of their outputs or outcomes (Lauer, 2004). Indeed Frost (2000) notes that "what gets measured, gets done" establishing the value of placing importance on properly emphasized and measurable standards (p. 6).

Incentive-based programs, such as the Color Company Competition, endeavor to turn resultant motivation into tangible performance outcomes. Clark (2005) defined motivation as "the process that energizes our knowledge and skills and focuses us on our most important goals" (p. 14). He continues by noting that motivation can develop sustained action over a period by helping individuals and teams to overcome distractions and competing goals. Stiffler (2006) found clear links to improved performance through pay (incentives) "by linking the achievement of objectives and demonstration of competencies to an individual's compensation…can help drive the behaviors that help organizations achieve their strategic objectives" (p. 28).

The Naval Academy, as a mechanistic institution, must overcome the inherent frustration that develops in people who must deal with little decision-making participation (on

a structural level), elaborate hierarchy of authority, and rigid emphasis on rules and regulations (Zeitz, 1983). It has been found beneficial for organizations to emphasize internal stimulus within individuals to overcome structural 'impediments'. Team competitions and incentives rewarded through the accomplishment of well established goals and guidelines can bolster a team's "sense of control and ability to achieve" (Short & Sullivan, 2003, p. 47).

This chapter reviews the current literature pertaining to performance measurement models, the relationships between academic, athletic and moral development, and current USNA policies.

B. THE COLOR COMPANY COMPETITION

1. Program Design

The Color Competition dates back to 1871. It was designed to support the mission of the Naval Academy by stimulating professional, academic, and athletic development of Midshipmen through intra-Brigade competition (USNA, 2001). Studies demonstrate the positive effect of competition and common goals on performance (Clark, 2005; Nalbantian & Schotter, 1997; Dickinson & Isaac, 1998). An important component in using competition is maintaining the focus on intra-team versus inter-team rivalry, such that the benefits of improved performance are achieved and instances of infighting are minimized (Dickinson & Isaac, 1998). Clark (2005) details that when competition goes awry "it can also engender a destructive level of internal competition and focus attention and energy away from organizational goals" (p. 16).

The competition encompasses three major areas of performance which include professional, academic, and

athletic. Each area is assigned a maximum of 150 points and can be summed for a total of 450. Individual companies receive color points based upon overall rankings across the brigade. Company rankings are according to its performance in various variables including both individual and team-based competitions.

Variables measuring professional development include drill and parade performance, Yard Patrol (YP) Craft seamanship, and a designated Company Assessment Program (CAP). The academic area of the competition is founded solely upon the academic quality point ratio (AQPR, based on a 4.00 scale) which is a composite of individual midshipmen AQPR for each company. The athletic component represents a composite of company performance on brigade intramural program and individual midshipman physical education (PE) grades.

At the completion of the academic year, the Brigade honors the company with the highest number of color points during the Color Parade. The ceremony includes a formal parade of midshipmen and a designated ‘color honoree’ passing the Brigade Flag from the old Color Company to the new. This company retains Color Company privileges for an entire academic year. Privileges include a specially marked guidon (company flag), the privilege to wear a gold “E” on uniforms and additional recognition at events such as Inaugural Ceremonies, as well as various individual awards presented to the company’s midshipmen leadership.

2. Teams and Subgroups

The company, as a subgroup of the Brigade at-large, becomes a symbolic ‘team’ within the confines of the tournament-based competition. Rouse’s study (2004)

illuminates the importance of having multiple areas of competition. She found positive correlations between motivation and work tasks that were more complex and "tap into more than one goal" (p. 30). She also noted that these goals may not necessarily be set into a stable hierarchy (i.e. goal priorities may consistently change) for each individual. In nearly all endeavors, especially associated with being a naval officer, people have to work with other people in groups to accomplish goals. Today's work norms include the 'team' concept creating a need to understand team dynamics and performance vital to organizational success (Lauer, 2004; Arce & Gunn, 2005). Mitchell (1982, p. 85) established that this "interdependence often makes it difficult to specify or tease out individual contributions" and he proposed that, to improve organizational outcomes, group goals or rewards be used.

Anderson (2005) found that "team members that are interdependent work better with others than they do alone" (p. 86) and that team effectiveness and interdependence were linked positively. Interdependence has been shown to foster growth in leadership behavior (Sosik et al, 2002). Slavin (1984) concluded that the positive attributes garnered through team competition are reinforced when group members all receive the same rewards based upon the team's performance. The more extension the interdependence within a group, the greater the achieved performance and effects on cohesion (Manning, 1991). The positive attributes observed in groups with large amounts of interdependence can be offset by the negative 'group think' concept. Guzzo and Dickson (1996) suggested that "polarized decisions" (p.

322) result from inappropriate communications within interdependent groups. Similarly, Anderson (2005, p. 86) finds that teams that are overly cohesive can “become too friendly and comfortable” and can show signs of groupthink.

Hamilton, Nickerson and Owan (2003) found that teams used certain collaborative skills to increase performance, skills that are much less valuable in individual-based production. Hamilton et al (2003) found significant improvement in worker productivity following the adoption of a team concept in one large organization as well as a reduction in turnover rates. Workers were observed joining groups despite taking a cut in absolute pay because of certain non-pecuniary rewards gained from being a team-member (shared work, greater output, camaraderie).

Other research suggests that group heterogeneity can lead to performance improvement. Studies advocate that a mix of high-ability and low-ability personnel is more advantageous than all workers having the same skill sets (Guzzo & Dickson, 1996; Guzzo & Shea, 1992; Hamilton et al, 2003). Higher-ability workers were seen developing, insisting upon, and even enforcing an elevated social norm. Furthermore, mutual learning (high-ability workers tutoring low-ability) was observed within teams demonstrating team member attempts to improve one another in an effort to enhance overall team performance. Teamwork also requires a significant input of nurturing to promote a consistent ‘team over self’ prioritization (Tonso, 2006).

Another important aspect relating to teams and their internal bond is the development of a shared history (Nalbantian & Schotter, 1997; VonMeter, 2004). An organization’s or subgroup’s ‘memoirs’ can imbue attached

individuals with improved senses of relatedness and belongingness (i.e. go through difficult challenges together) and enrich the team member's concept of self-worth (i.e. being part of a winner). Common experiences can cultivate a team's camaraderie, help overcome perceived or real individual differences, and even improve output performance. The history can be positive or negative to improve the cohesion of the team, but Nalbantian and Schotter (1997) found that positive experiences produce greater increases in overall performance levels.

Overall, teams (including the construct of teamwork) have been found to improve learning performance (Tonso, 2006). Group projects instill teamwork into individuals and improve group dynamics. Team-building exercises can help to foster this cohesive joint-effort approach through practical application (Mitchell, 1982; Clark, 2005). Anderson (2005) noted that teams with a higher order of cohesion tend to produce greater positive emotion and high individual affect. Team cohesion, as noted specifically in military organizations, develops better decision making abilities while under time pressures (Guzzo & Dickson, 1996).

3. Competition and Morale

Nalbantian and Schotter (1997, p. 316) showed that within-institution competition increases group effort and that "group incentives can contribute to significant increases in labor productivity and firm performance." Furthermore, the Hamilton et al study (2003) determined that external peer pressure (guilt) and internal pressure (shame and social punishment) can push a group to establish 'higher' social norms of performance in competitive

milieus. Research regarding peer tutoring, an example of raising social norms within a group, has shown that students teaching students help both to learn academic material more effectively (Slavin, 1984).

A counter-effect of groups, noted by Clark (2005), is the concept of social loafing where team members invest less energy into a project than they would as sole individuals working on a project. Short and Sullivan (2003) found that teams with a weak sense of confidence can lower high performing individual team member performance and confidence. This study also concluded that irrelevant or even detrimental effects were obtained when teams focused on the wrong elements of competition (such as solely on outcome, win-or-lose).

Morale is inclusive of both an individual's affective (general well-being) and emotive (enthusiasm for group activities) response to their organization (Zeitz, 1983). Manning (1991, p. 454) characterized morale as "the mental, emotional, and spiritual state of the individual" effecting group dynamics. Shared by the group, morale is a team's dedication to a plan or idea, especially when members deem that paradigm meaningful. Several studies (Manning, 1991; Hightower, 1944; Tompkins & Jones, 1950) have put forth postulations on the determinants of morale including individual factors (food, health) and group factors (relational comradeship, shared experiences) demonstrating how morale is affected by both personal and team dynamics.

Cohesiveness, though no 'true' definition has been agreed upon, is often described as an individual's sense of belonging to a specific group or team and feelings of morale connected with membership in the group (Bollen &

Hoyle, 1990). Bollen and Hoyle (1990) suggest that cohesion may be comprised of belonging (cognitive) and morale (affect). This study yielded high correlations (0.90) between belonging and morale; an individual's sense of belonging directly affects feelings of morale and morale directly affects one's sense of belonging. Cohesion is essentially the construct involved with one's reflection of their relation, or physical unity, to a team. A team member can, upon losing a sense of cohesion, begin feeling loneliness and isolation (Manning, 1991).

When properly fostered, these two constructs can significantly influence the potential performance output of a team or group. Individuals obtain value and self-esteem from the consequences of group work. Soaring morale and team cohesion require goals, individual roles, and a rationale (Manning, 1991; Bollen & Hoyle, 1990). The camaraderie and bonding together of individuals to form a team with common and distinct goals has been observed to be the difference between victory and defeat on many occasion. Team members are most effective when they understand what their role is and its importance within the group. Worthwhile objectives maximize participation from involved stakeholders leading to improved self-confidence. It is here, within the realm of morale and cohesion, that success truly begets success. Victories by Joan of Arc, Napoleon, and Hannibal (the list is nearly endless) validate the power of morale and cohesion overcoming amazing odds (Pope, 1941).

C. THE COMPANY INCENTIVE PROGRAM

1. Program Design

The Company Incentive Program originated in the spring semester of 2005. It encompasses the three performance areas included in the Color Competition (professional, academic, and athletic) and is comprised of a total point count of 100 (USNA, 2005). This program incorporates differences between each semester's activities by assigning a different point score to certain variables. The incentive program's data compilation is conducted at the completion of each semester and the results are directly tied to a liberty-based (time away from the Naval Academy) incentives. With several variables within each category, this program uses both rank- and criterion-based scoring to determine company rankings. Companies are ranked according to the sum of all of the averages and then graded as outstanding (6 companies), excellent (9 companies), and satisfactory (15 companies).

2. Color Company and Company Incentive Program Differences

There are some notable differences between the Color Company Competition and the Company Incentive Program. Within the professional category, the Incentive Program includes 4/C midshipmen professional knowledge quizzes and measures both the average conduct grades and overall number of conduct offenses within the company. The academic category of the Incentive Program includes (above the variables overlapping the Color Competition) academic absences and as well as a measure of the percent change in a company's semester AQPR. Additionally, the Incentive Program accounts for additional athletic-related variables.

These variables include a company's PRT pass rate and spirit competitions conducted by companies relating to common Naval Academy functions.

3. Incentives and Motivation

Studies show that setting proper levels of compensation and incentives can ensure that employees feel valued and sufficiently motivated (Nalbantian & Schotter, 1997; Mitchell, 1982; Chyung, 2005; Dickinson & Isaac, 1998). Nalbantian et al (1997) went farther arguing that employees will likely, if given the chance, begin 'shirking' responsibilities when the provided incentives are either not sufficient or not relevant. Establishing 'prizes' that are sufficiently significant can generate enough extrinsic motivation for a team to "always want to win the prize outright" (Dickson & Isaac, 1998, p. 302). Arce and Gunn (2005) detailed this notion (work versus shirk) as part of an individual's struggle in fulfilling two separate roles: principle (teammate) and agent (overseer). As a teammate, individuals determine a personal cost for accomplishing work or exerting effort (i.e. to study or to cheat). As an overseer, individuals must enforce the in-place honor code and hold peers accountable.

Direct links between extrinsic motivation (incentives) and intrinsic motivation (initiative) also cause affiliation with performance; as motivation improves, performance improves (Arnold, 1985). Motivational incentives have even been proven to produce extremely successful results during experiments with 'poorly' planned learning materials (Tosti, 2005). This finding demonstrates that even with inferior equipment or

abilities, positive performance is still possible through sufficient motivation and incentive programs. Albert Bandura argued that “the development of self-motivation and self-direction requires certain basic functions that are developed through the aid of external incentives” and that “the capability for evaluative self-reinforcement is established partly through the influence of extrinsic reinforcement (as cited in Arnold, 1985, p. 877).”

Clark (2005) suggests that it is more difficult to motivate a team than a single individual. The difficulty lies cultivating an individual’s belief that their efforts are evaluated consistently and impartially with the performance of the entire team. Similarly, VonMeter (2004, p. 17) argues that an individual’s perception of their abilities “defines and guides” their decision-making and behavior in competitive (achievement) situations.” Sosik, Potosky and Jung (2002) concluded that team members covet equivalence between the perception they and others have regarding their performance and that individuals will actually set and strive for goals that reduce any perceived discrepancies. Zeitz (1983) ascertained that morale and satisfaction were both positively affected by loose, flexible structures (defined as organic organizations) where individuals could influence their tasks and rules.

Greenlees, Lane, Thelwell, Holder and Hobson (2005) found that when teams are involved motivation can be directly linked to the stability in an individual’s perception of locus of causality (either external or internal) as well as the team’s assessment regarding influencing ability. Essentially, the more an individual perceives group outcomes linked to their own output, the

more motivated that individual is to perform. Additionally, if a team comes to consensus that it can influence the environment in which it performs, motivation can improve. Slavin's study (1984), in support of these findings, demonstrated that "incentive systems based on group performance create norms in favor of achievement" and that this was linked to peer-to-peer encouragement observed while working toward common goals (p. 54).

Richard Clark's (2004) review of motivational factors detailed several 'killers' that work in many of today's organizational cultures. The three most applicable motivational killers include telling lies, setting unclear performance goals, and expressing constant cynicism and negativity. Clark's concept of 'telling lies' includes misinformation or misunderstood truths that are seen as important to stakeholders within an institution. If stakeholders perceive certain policies or procedures as not 'completely on the level', then that policy gains the status of being treacherous. Setting vague performance goals allow workers to substitute their own personal goals in place of organizational goals and can even create a culture of "anything goes" within the group. Clark (2004) concluded that cynicism and pessimism breed one another and that "depressed people enjoy saying and hearing depressing things" (p. 20).

D. PERFORMANCE MEASUREMENT AND MODELS OF MOTIVATION

Studies show many high caliber and productive institutions have launched specific performance measurement programs in an attempt to operate more effectively. Performance measurement, or appraisal, has been studied as "the system whereby an organization assigns some 'score' to

indicate the level of performance of a target person or group" (Hartog, Boselie and Paauwe, 2004, p. 557). Evans (2002) further noted that "performance measurement is one of many available tools that organizations use to manage their processes and control their organizational outputs and outcomes" (p. 12).

As an example, the United States Government during the 1990's created legislation to adopt a "practice of strategic management" (Evans, 2002, p. 10). This specific program was created to assist the government to improve the public's perception of the government and its capabilities, improve effectiveness and accountability, while improving internal management. The aim of this and any performance measurement tool is to determine the reasons for success, establish resolute goals of achievement, and present a path to reach those goals.

Performance, as relating particularly to this study, is defined as produced accomplishment or output (Harbour, 1997) as opposed to simply a behavior or attitude. These accomplishment measures allow for empirical analysis of the construct as opposed to behavior measurement, a much more abstract and qualitative undertaking. It is this empirical analysis that provides a definite look into an institution's performance and sees if the performance quality is at the desired level (Evans, 2002).

As part of a performance analysis, interpretation of in-process parameters allows for prediction of the outcome performance (Harbour, 1997). Improvement in analyzing the in-process parameters will allow for enhancement of the outcome performance. McCloy (1990) demonstrated that little attention or research had been focused on

understanding performance criteria compared to the work involving predictors. This study shows the desirability to focus on the predictors rather than attempt to delve excessively into the criteria that create those predictors.

Researching the Color Company Competition at the Naval Academy is foundationally based around a thorough review of the current performance measurement and management literature. The literature spans the fields of economics, psychology, and human performance technology and is applicable to both private and public sector organizations. Peer-reviewed journal articles, magazine and internet articles, and books were examined during this study.

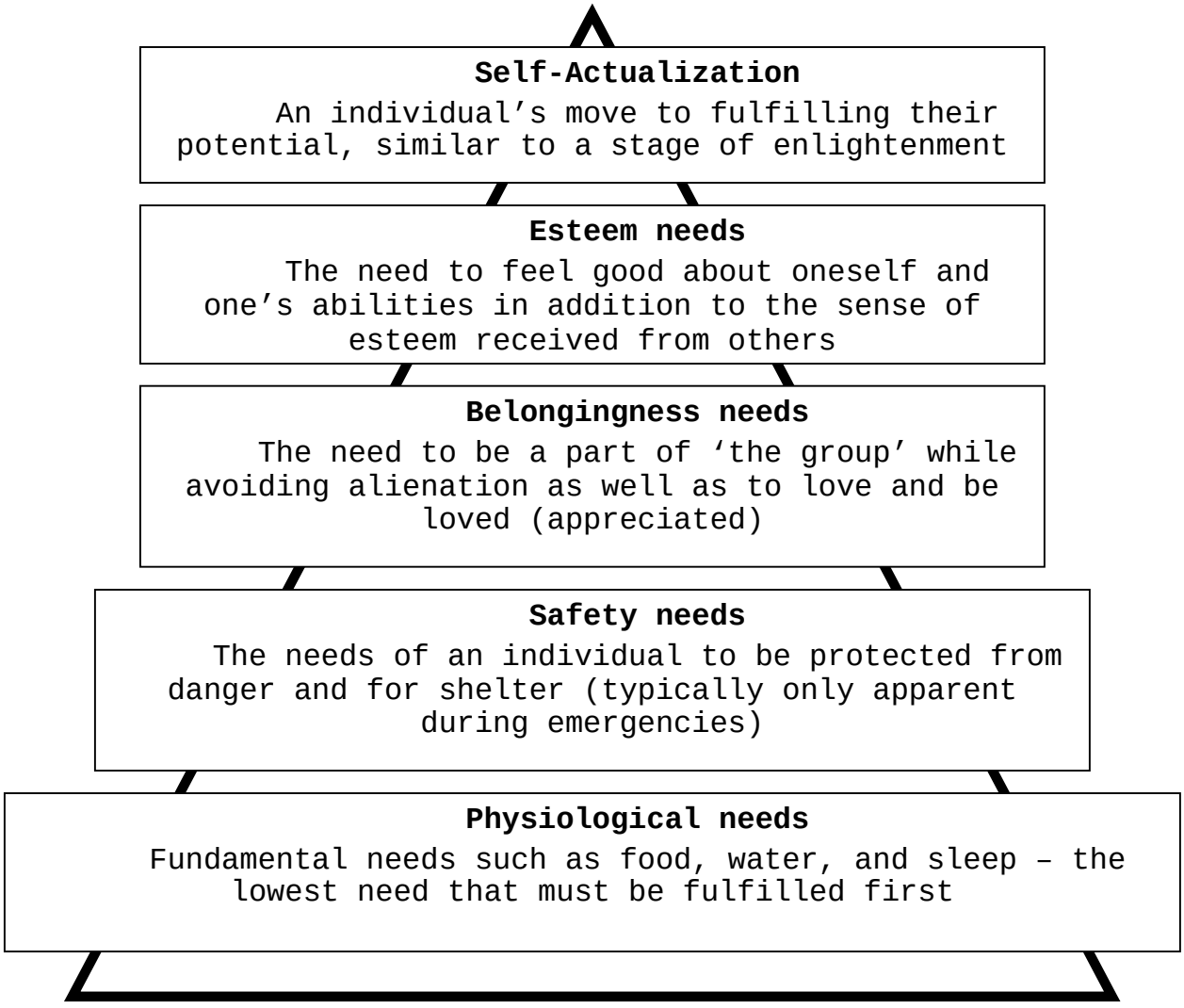
Needs-based theories and systematic approaches to performance were presented in this project. Understanding different approaches provides interested individuals an opportunity to recognize more effectively how organizations are arranged and the effects that those arrangements have on performance. Each of the presented premises exhibit the importance of aligning goals, developing a sense of community within a group, provision of resources to the group, and appropriate selection of incentives to effectively motivate desired performance.

1. Needs-Based and Motivation Models of Performance

Maslow (1970) developed a hierarchical list of needs that suggests that individuals are motivated and driven to fulfill (Mitchell, 1982; Rouse, 2004). Though not completely defined by Maslow’s research, adherents to this model commonly accept that individuals must completely satisfy lower needs in order to escalate from a lower need to a higher need. For example, for an individual to seek out and meet needs of belongingness, that individual must

feel satisfied regarding their safety and physiological needs. If deficiencies arise in subordinate need levels, the individual must focus effort on restoring the satisfaction of the lower needs before attempting to continue achieving higher levels of Maslow's hierarchy.

Figure 1. Maslow's Hierarchy of Human Needs



***Source: Adapted from Rouse, 2004**

However, Sackett argues that all of the steps of the hierarchy, and specifically the step of self-actualization,

are more of a process than an end state (as cited in Rouse, 2004, p. 29). This argument, utilizing the same needs hierarchy, dictates that individuals can strive for or be motivated by needs on multiple levels at the same time. These deficient needs may not even have any or little relation to one another and can be satisfied through different actions. The most pertinent of Maslow's needs to this study would be the needs for belongingness and self-esteem.

An alternative needs-based theory is the Motivational Systems Theory (MST). This theory emerged as human performance technology (HPT) researchers began recognizing that needs and motivations do not always fall into a stable and common hierarchy. As a more complex premise, MST concentrates on individual motivations from goal setting. Motivations include goals, emotions, and belief in one's abilities and support, or personal agency beliefs (Rouse, 2004). MST includes twenty-four espoused human goals that are not hierarchical in nature. These requirements are categorized into two areas: desired within-person consequences (one's ability) and desired person-environment consequences (environmental support).

Figure 2. MST Individual Motivations – One's Ability

<table>
<tr><th colspan="3">Desired Within-Person Consequences</th></tr>
<tr><th>Affective Goals</th><th>Cognitive Goals</th><th>Subjective Org. Goals</th></tr>
<tr><td>Entertainment</td><td>Exploration</td><td rowspan="2">Unity</td></tr>
<tr><td>Tranquility</td><td>Understand-ing</td></tr>
<tr><td>Happiness</td><td>Intellectual Creativity</td><td rowspan="3">Transcen-dence</td></tr>
<tr><td>Bodily Sensations</td><td rowspan="2">Positive Self-Evaluation</td></tr>
<tr><td>Physical Well-Being</td></tr>
</table>

***Source: Adapted from Rouse, 2004**

Figure 3. MST Individual Motivations – Environmental Support

<table>
<tr><th colspan="3">Desired Person-Environment Consequences</th></tr>
<tr><th>Self-Assertive Social Relationship Goals</th><th>Integrative Social Relationship Goals</th><th>Task Goals</th></tr>
<tr><td>Individuality</td><td>Sense of Belonging</td><td>Mastery</td></tr>
<tr><td>Self-Determination</td><td>Social Liability</td><td>Task Creativity</td></tr>
<tr><td>Superiority</td><td>Equity</td><td>Management</td></tr>
<tr><td rowspan="2">Resource Acquisition</td><td rowspan="2">Resource Provision</td><td>Material Gain</td></tr>
<tr><td>Safety</td></tr>
</table>

***Source: Adapted from Rouse, 2004**

Relating Maslow's hierarchy to MST reveals the relevance of both models to the study of group dynamics and teams. Belongingness appears in both prototypes, relating to an individual's desire for a sense of community and avoidance of social isolation. Studies have shown that the belongingness that is fulfilled from team participation is positively correlated to self-confidence and, thus, self-

esteem (Scott & Tiessen, 1999; Short & Sullivan, 2003). Social responsibility and positive self-evaluation, both MST ideas, build on the importance individual's place on self-esteem and belongingness.

Chung (1968) presented an empirical needs-based model of motivation and performance. He developed this theorem in an attempt to provide a comprehensive model with universal applicability incorporating several partial theories. Some partial theories, such as Atkinson's formula (referred to in Chung, 1968), concern only limited concepts relating to the study of motivation and performance. He proposed that performance (P) was directly linked to ability (A) and motivation (M); motivation is derived from the interaction of multiple (and often conflicting) needs (N), incentives (I), and expectancies (E).

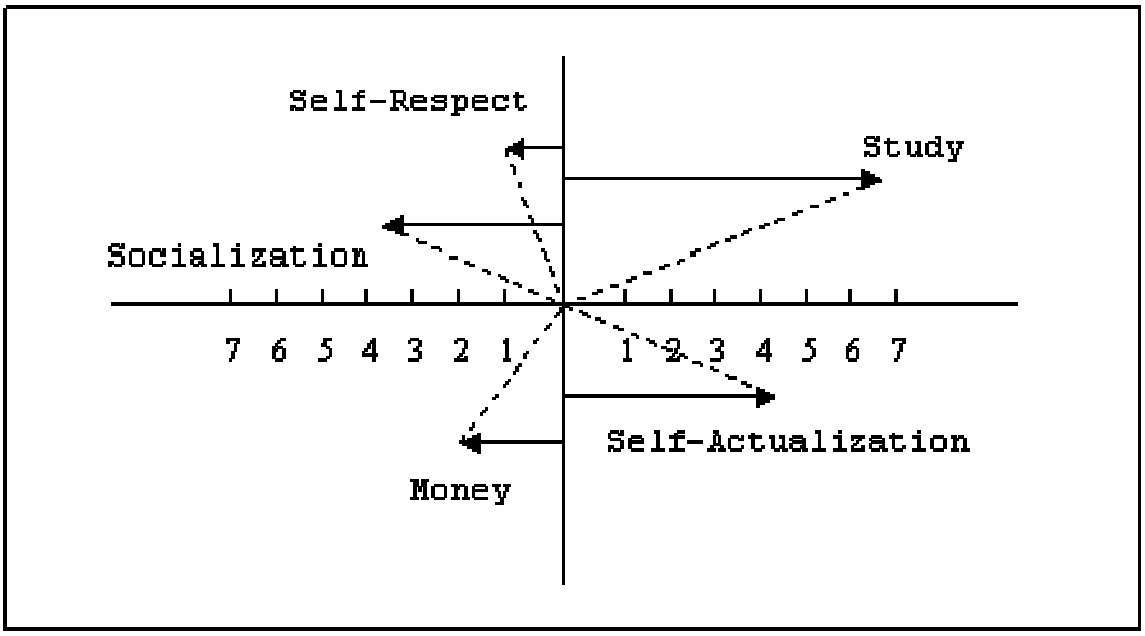
Figure 4. Unified Performance and Motivation Equations

$$P = f(A * M)$$
$$M = \sum f(Ni * Ii * Ei)$$

Unlike the Atkinson formula, that only included the need for achievement and associated incentive and expectancy variables, the comprehensive formula ties in many of the needs seen in Maslow's work and the MST. Needs that are accounted for by this theory include: physiological, safety, affiliation, self-esteem, and self-actualization. The effects of the model can be visualized as a vector diagram, ostensibly pulling an individual

towards an outcome via a torturous path. Figure 5 illustrates the example provided by Chung (1968) of a student that has a foremost need to study but is also experiencing alternative desires that may oppose (socialization), partially oppose (money), neutral (self-respect), and partially correlate (self-actualization).

Figure 5. Comprehensive Model Vector Analysis



***Source: Adapted from Chung, 1968**

2. Systems Approach to Performance

Performance measurement frameworks can systematically clarify relationships between measurable variables and performance outcomes. The Big Five is one such framework proposed by Human Performance Technology (HPT) researchers (Tosti, 2005). The first element, support, details the importance of developing an environment that allows personnel "to take action to achieve desired results" (p.

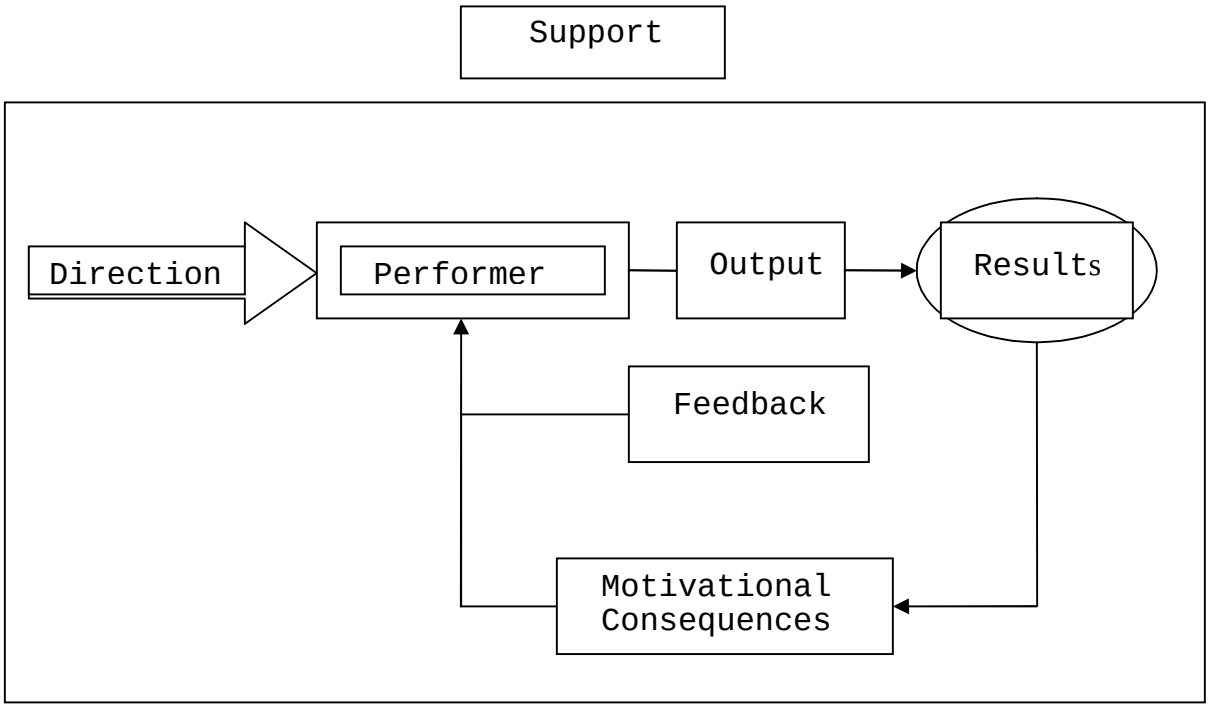
11). Direction, the next building block, describes the magnitude of clearly and effectively communicating to team members what is their expected actions or performance. These two factors incorporate the environment's structure and the policies set forth by supervisors.

The next feature of the Big Five is the performers themselves. Previous knowledge and learned skills, capabilities, and interests are all fundamental aspects of individual performance. This facet also includes, beyond capacity and repertoire (previous knowledge), psychological factors such as motivation and confidence on individual levels.

The final two variables can be characterized as post-performance enhancers. Motivational consequences comprise the value of incentives, the contingency of consequences, and the balance of consequences. Value pertains directly to whether the incentives are perceived as sufficiently rewarding and positive to the team members. Contingency refers to the timeliness of the rewards related to the actual performance whereas balance involves a mix of both positive and negative consequences based on performance.

Feedback is the final part of the human performance technology systematic approach. This concept includes the ideas of fit, focus, and timing. Fit is essentially the team member's determination that information is relevant and understandable. Focus communicates that the transmitted information is not confounded and that it does not overwhelm the individual, and timing is a measure of whether the information is provided in an appropriate and useful moment (i.e. not excessively long after the performance).

Figure 6. HPT Systems Approach



***Source: Adapted from Tosti, 2005**

Another systematic framework postulated by human performance technology professionals is the Behavior Engineering Model (Chyung, 2005). This outline, championed by Thomas Gilbert in 1978, includes three theorems relating external provision and an individual's "repertory of behavior" (p. 25). The first 'leisurely' theorem, Gilbert delineates between behavior (actions, means) and the outcomes of behavior (consequences, ends).

The second leisurely theorem states that the difference between expected exemplary performance and actual typical performance as the potential for improving performance, or PIP (Chyung, 2005). The PIP can be diagnostically analyzed by determining deficiencies or excesses in certain areas required for performance. Figure

7 illustrates these areas: data, instruments, incentives, knowledge, capacity, and motives.

Figure 7. Behavior Engineering Model

	Information	**Instrumentation**	**Motivation**
Environmental Supports (E)	Data	Instruments	Incentives
Person's Repertory of Behavior (P)	Knowledge	Capacity	Motives

***Source: Adapted from Chyung, 2005**

The third and final theorem of the Behavior Engineering Model specifically relates to the systematic management of the six stated factors. Logical sequencing from one aspect of the model to the next would be from data to knowledge through instruments and incentives, thus improving individual or team capacity for performance that motivates future performance. The model allows for the development of appropriate interventions upon observing defective performance. Gilbert stressed that incompetent performance could most often be attributed to environmental support deficiencies thereby causing failures in individual behavior.

E. MORALLY, MENTALLY, AND PHYSICALLY

The establishment of appropriate parameters is required to ensure that pertinent data are obtained for analysis (Harbour, 1997). A look at the aforementioned mission of the Naval Academy reveals the three tenets of morally, mentally, and physically (USNA, 2006). The development of these qualities helps to mold naval officers who are persons of character and integrity. These traits

will also produce individuals who are motivated to influence their culture positively both inside and outside of the military.

1. Morally and Mentally

USNA expends significant effort on the moral development of midshipmen. Roundtable discussions have spawned programs aimed to facilitate the growth of "moral reasoning through educational experiences" (Clark, 2004, p. 15). The Naval Academy directly links its goal of producing persons of integrity to lead the sailors and marines of the U.S. Navy and Marine Corps to midshipmen moral development. Attributes such as ethical behavior and moral conduct are instilled in midshipmen during their four years of instruction. The Academy's Strategic Plan (USNA, 2006) includes a vision statement absolutely coupled with the moral maturation of midshipmen. The Naval Academy's vision statement, spawned from its mission, reads:

> Provide leaders of great character, competence, vision and drive to transform the Navy and Marine Corps and serve the nation in a century of promise and uncertainty.

Academic performance and general mental ability (GMA) have been strongly correlated with a wide range of 'life outcomes' from criminal tendencies to even the basic understanding and capability of using public transportation (Schmidt & Hunter, 2004). These concepts also can adequately predict more tangible and relevant outcomes such as attainable occupational levels and probably ability during such work. Schmidt and Hunter (2004) specifically determined correlations of 0.50 and higher between general mental ability and occupational level, on-the-job performance, and job training performance. Polk (2003)

obtained similar results and was able to tie those results directly to service retention (to certain career milestones) and performance (as conveyed by fitness reports). These results establish the link between general cognitive ability and an individual's ability to complete seemingly unrelated tasks successfully. Fundamentally, as a team member's intelligence or cognitive level improves, the individual's output performance in all aspects generally improves.

The graduates it produces mark the success of the Naval Academy, as with all academic institutions. Grade point averages and test scores typically quantify scholastic success. At the Naval Academy, scholastic achievement is broken into Academic Quality Point Ratio (AQPR) and Military Quality Point Ratio (MQPR), both equivalent to grade point averages. Studies have shown that cognitive ability directly affects the quality of leadership that an individual can demonstrate (Bartone, 2002). It is this improved "later leader performance" (p. 326) which is so important to the military and, thus, becomes an important aspect of service academy performance.

For this study, and based upon the Naval Academy's current scholastic curriculum, midshipmen moral and mental development will be combined into one academic measure.

2. Physically

Several studies have demonstrated a strong relationship between athletic participation and leadership development (Gerdes, 2001; VonMeter, 2004, Short & Sullivan, 2003). Athletic activity allows individuals the ability to improve cognitive and affective ability, instill confidence, and improve moral development; traits that are

vital to the development of leadership. As interconnected concepts, individual and team confidence, or collective efficacy, tends to bolster team member performance (Short & Sullivan, 2003). As a major focus area in the Academy's Stategic Plan (USNA, 2006), physical fitness helps "foster decisive leadership, teamwork, character and a passion for "winning"."

The intramural, club, and varsity sport programs at the Naval Academy afford every midshipmen the opportunity for instrumental growth as individuals. Team participation and competition foster higher goals for physical fitness, above that which may exist solely in an individual's aspiration (VonMeter, 2004). Robbins (2004) found that athletic participation related directly to positive performance as a naval officer and improved retention in the service, both desired results of the Academy program. Polk (2003) found negligible differences in athletic aptitude and performance between Varsity Athletes and the 'typical' midshipmen, noting that the similarities are probably due to previous (high school) high levels of athletic competition.

F. MILITARY PROFESSIONALISM

The military constituent of the Naval Academy's mission, that of "providing graduates who are dedicated to a career of naval service", can be similarly quantified in some part through academic grades because of the Naval Academy's unique curriculum (USNA, 2006). The Academy's regimen is concentrated on producing leaders who are courageous and take responsible action while "integrating geopolitical complexities in their decision making." Sosik et al (2002) found that individuals who are able to

effectively adapt and remain flexible to outside expectations tend to be much more adept at responding to the sometimes convoluted and changing pace found in dynamic organizations, such as today's military.

This component of the Naval Academy's mission takes on an added role in that military service that will be an indelible part of these students' lives for at least five years after graduation from the Academy. Specific academic classes taken during each academic year, as well as individual Aptitude for Commissioning and Conduct grades (both semesters for all four years), factor into the student's Military Quality Point Rating (MQPR).

In today's tactical world where nations, and specifically the United States, are continuously trying to protect themselves from rogue states or organizations, military professionalism is an extremely relevant factor in the training of midshipmen, preparing them for tomorrow.

G. CHAPTER SUMMARY

This chapter reviewed the current literature and detailed further specifics of the Color Company Competition and the Company Incentive Program at the Naval Academy. Chapter II also illuminated various possible performance measurement models and their individual characteristics. Additionally, this chapter reviewed the specific tenets of the Naval Academy's mission including the military constituent that separates this military institution from other academic forums.

II. RESEARCH METHODOLOGY

A. INTRODUCTION

This study seeks to validate the current algorithm and procedures to identify the 'most outstanding' company within the Brigade of Midshipmen at the U. S. Naval Academy. This chapter is divided into two main parts. The first part includes an overview description of the review of literature pertaining to this study. This includes literature from diverse fields of study such as economics, psychology, and performance measurement in addition to various directives in place detailing operations at the Naval Academy.

The second section includes a description of the obtained data and the specific variables being reviewed. The variables are separated by how the variables are used as part of the Color Company Competition (i.e. academic, physical, and professional). This section also describes a discussion of the Brigade Climate Survey that was given to the Brigade of Midshipmen during the 2005 academic year. The chapter then concludes with a brief summary of the research methodology.

B. DATA AND VARIABLES DESCRIPTION

The Institutional Research (IR) Department of USNA compiled and provided data records of midshipmen academic, athletic, and professional performance. The Physical Education Department at the Naval Academy provided additional athletic merit data relating to company intramural sport performance and individual physical readiness scores. The Activities Office also supplied this study with data concerning company rankings in a majority

of other measured ‘team’ categories (YP competition, drill, Worden Whirl, etc.) and provided the final Color Company Competition standings for 2005. The criterion for selecting the measures detailed within this section was that the variables were directed for inclusion within the Color Company Competition by the current Naval Academy instruction in use (USNA, 2001).

IR also provided data regarding the Brigade Climate Survey that was taken by a random sample of midshipmen during the spring semester in 2005. This survey included questions that were based upon individual midshipman’s sense of leadership, equity and fairness, safety and security, and morale within their company. Midshipman answers were ranked according to a Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree) yielding ordinal results. Based on relevance for this study, specific questions were selected for review.

The participants included all of the midshipmen within the Brigade during the academic years of 2001-2005. These academic years include the year groups of 2000-2008. The participants’ association with their individual company created groups within the Brigade. The Brigade Climate Survey has only been presented to the classes present at the Naval Academy during the 2005 academic year (2005, 2006, 2007, and 2008). This survey will be replicated for following years. The results of the midshipmen performance and answers affect only their respective companies; companies include approximately 135 midshipmen. Midshipmen ages range from 17-25 years old.

1. Dependant and Independent Variables

a. Color Point Ranking

Color Point ranking is the dependent variable of the study. This ranking is an overall indication of each company's performance as measured against the mission statement of the Naval Academy. For equivalence of comparison, company rankings were used to determine color points (the rank of 1 signifies the top company and the rank of 30 denotes the worst) as opposed to the use of accumulated color point tallies. The analysis of accumulated color points would yield slightly different, though comparable, results to the ranking scheme. Obtaining additional pertinent information about statistical significances and variable coefficients is the benefit, though, of using rankings. The Color Points, though a specific ratio statistic itself, is a measure of the construct of performance.

b. Mentally and Physically

These tenets of the Academy's mission evolve into the independent variables of academic (including both moral and mental constituents) performance and athletic merit. Academic performance is an interval measurement based upon each company's overall AQPR achieved each semester. This overall company AQPR is calculated from averaging the individual AQPRs achieved by each company member during the fall and spring semester. Athletic merit, also an interval measurement, integrates each company's standing within the brigade according to various intramural competitions and participation of company members in varsity and club athletics. Midshipmen performance in athletics outside of the conventional intramural program (i.e. varsity or club

athletics) is quantified by the Physical Education Department adding an additional component to the seasonal intramural results. This factor accounts for both in-season and out-of-season athletic participation because varsity athletes are not required to partake in the Academy's intramural program; in-season participation is weighed heavier than out-of-season involvement due to the amount of time and effort exerted. In addition, fall and spring Physical Readiness Test (PRT) and Physical Education (PE) classes are incorporated (combining to form a midshipman's PE Grade for each semester) within the athletic constituent of the Color Competition.

Table 1. Mental Measures and Percentages

Measure	Number of Points Allotted	Percentage of Overall Competition (%)
Fall AQPR	75	16.7
Spring AQPR	75	16.7
Total Points	150	33.3

Table 2. Physical Measures and Percentages

Measure	Number of Points Allotted	Percentage of Overall Competition (%)
Fall Intramurals	38	8.4
Winter Intramurals	38	8.4
Spring Intramurals	38	8.4
Fall PE grade	15	3.3
Spring PE grade	15	3.3
Worden Whirl	6	1.3
Total Points	150	33.3

Tables 1 and 2 illustrate the various independent variables quantified in and the variables' overall effect on the Color Company Competition.

c. Military Professionalism

The Naval Academy's unique stature as a military academy requires the measurement and monitoring of midshipman professional ability and growth. According to directed guidance (USNA, 2001), this element includes drill performance during both semesters, military courses, wargaming, and a Yard Patrol (YP) Craft competition. As noted previously, the wargaming component has become defunct since the creation of the instruction and the military courses have been removed from this portion of the competition because they are also part of the AQPR measure. Table 3 details the specific measures of performance directed to be considered during the competition. The final tally of points (and the associated percentages) reveal the instruction's intent that each of the three tiers of performance are equally (33.3%, 150 points) weighted.

Table 3. Military Professionalism Measures and Percentages

Measure	Number of Points Allotted	Percentage of Overall Competition (%)
Fall Drill Results	40	8.8
Spring Drill Results	20	4.4
Wargaming	15	3.3
CAP Inspection	15	3.3
Fall YP	15	3.3
Spring YP	15	3.3
Monster Mash	15	3.3
NN204/NS100 Grades	15	3.3
Total Points	150	33.3

2. Brigade Climate Survey

Climate is considered to be developed by the interrelation of morale and cohesion (a sense of esprit de corps), ability and potential, and success (Manning, 1991; Arnold, 1985). A positive climate can develop a strong sense of camaraderie and belongingness, devotion to team success, and improve individual effort towards common goals. A negative climate breeds hostility, isolationism, and individual selfishness (i.e. protect what is yours against what is or can be the team's). Both of these situations can become self-fulfilling prophecies; for example, success within a group makes individual team members bond more deeply and become more willing to exert effort in future actions, thereby improving team output and performance.

The Brigade Climate Survey, a project commissioned by the Command Management Equal Opportunity (CMEO) program at

the Naval Academy, was developed in order to assess the overall environment within Bancroft Hall (midshipmen dormitory). A survey which included fifty-six questions was posed to a random sample of midshipmen (n=1367) within the Brigade during the 2005 academic year. These questions addressed topics such as leadership within the company, concerns with fraternization and sexual harassment, discrimination and overall equality, as well as basic morale within the company setting. The Likert scale answer scheme allowed midshipmen to respond according to their own personal relation to the company and their company-mates.

Questions from the Brigade Climate Survey were selected for review during this study according to their relevance to the topics in question. Leadership and morale queries were chosen because of their unique effect on an individual's sense of satisfaction and belongingness, both of which have been shown to positively affect team member performance. Several other questions could have been utilized during this study; however, the review of the literature provided direction toward and emphasis on questions specifying an individual's perception of teamwork, belongingness, and morale.

The questions chosen were:

- Question 3. The midshipmen chain of command is working hard to make my company the best in the Brigade.
- Question 6. My company chain of command promotes teamwork.
- Question 10. The midshipmen company leadership recognizes people who deserve it.

- Question 46. I enjoy being a member of this company.
- Question 56. On a scale of 1 (low) to 5 (high), rate the morale of your company.

3. Data Manipulation

The data was arranged such that individual midshipmen were grouped according to their respective companies. This was especially useful for the data regarding fall and spring semester AQPR, PRT scores, and Brigade Climate Survey results, all of which are measured strictly on an individual basis. Company averages were calculated according to the individual performances and corresponding company rankings were established for each academic year available (2001 to 2005). Seasonal intramural results and other 'team' activities (drill, YP competition, Worden Whirl, etc.) were also ranked according to company standing within the Brigade during this time frame. The various company rankings were compared to the Activities Office's records concerning final 2005 Color Company standings.

The analytic approach included performing linear regressions (outcomes reported in results chapter of this study) to validate the Color Competition procedures actually used against the directed guidance. The OLS analysis was done using the data collated from the various sources around the Academy. The different models analyzed used the ranking format versus the accumulated color points. When regression analysis was performed using accumulated color points as the dependent variable (vice ranking), different but comparable values relating the model's effectiveness were obtained.

Additionally, the data was arranged to assess company performance historically once the company was recognized as the Color Company. For example, 5th Company earned Color Company status during the 2002 academic year. The arrangement allowed a statistical comparison of the company's performance the year during the achievement versus the following year (reward period). Simply put, this analysis provided insight into the effect upon an individual company's academic performance of being 'tagged' as Color Company.

Brigade Climate Survey results, another individually aggregated datum, were grouped according to company, means were calculated, and then rankings established. Correlations were determined between the Color Company rankings and the specifically chosen questions from the survey. Linear regressions were conducted to ascertain the effects and significance of the various climate related issues to company performance.

C. CHAPTER SUMMARY

This chapter was composed of a discussion about the research methodology utilized during the course of this study. The section began by reiterating some of the performance measurement tools explored during the review of literature. Next, the segment introduced the specific sources of quantitative data as well as descriptions of the data. This discussion incorporated Brigade Climate Survey data obtained from a random sample of 2086 students (1367 responses, 32.7% of entire midshipmen population) within the Brigade of Midshipmen during the 2005 academic year. Finally, the chapter explained the manipulation of the data

and the use of linear regression models conducted during the course of this study.

IV. DATA ANALYSIS

A. INTRODUCTION

This chapter details the analysis of the obtained data pertinent to this research project. This examination determines the validity of the current procedures used at the Naval Academy to acknowledge stellar company performance. It includes a discussion of the linear regression analysis results of Color Company rankings versus individual independent variables (both actual and directed variables) measured during the competition. These individual independent variables are grouped into three categories (mental, physical, and professional) according to their contribution in the Color Company Competition.

A comparison is conducted between the actual results published by the Activities and Performance Office of the Naval Academy and the results that would be achieved through strict adherence to the directed instruction. The analysis additionally features a review of resultant performance upon designation as the Color Company. The examination concludes by observing various effects of morale and cohesion on company performance as shown through the recent Brigade Climate Survey.

B. OUTCOME ANALYSIS

1. OLS Results

Linear regressions were designed to show relationships between the independent variables and the dependent variable used during competition calculations. The independent variables were divided into the three component categories of mental, physical and professional matching the Naval Academy’s mission (USNA, 2006). Table 4

illustrates the three categories and the related regression models conducted. Models (1) and (2) are nested regressions within the general Color Company algorithm used in model (3).

Model (1) details the mental constituents measured versus Final Color Company Rankings. Spring AQPR (SprAQPR) and Fall AQPR (FallAQPR) were both positive and significant during the analysis (to the 0.01 and 0.05 levels, respectively). The F-statistic significance (0.000) reveals an additional measure of important consequence for the analysis, showing that these independent variables are jointly significant explaining the variance in the dependent variable. Finally, the Adjusted R^2 value of 0.660 demonstrates that the model, using only two variables, accounts for approximately 66% of the entire variance in company rankings.

Model (2) takes the previous model a step farther by providing the additional physical measures of the competition in the OLS analysis. Both mental variables remain significant and positive along with the physical variables of Fall and Winter intramural results and the Worden Whirl. The F-statistic continues to be large and significant. The R^2 value of 0.880 shows that the model, now including eight variables, accounts for approximately 88% of the competition's variance in results.

Model (3), the most general model, includes all previous independent variables in addition to the measures for professional development. These additional variables (although statistically insignificant) increase the R^2 value to 0.928 and complete the model's 'three tier'

approximation of the Naval Academy's mission. As with the previous two 'nested' model regressions, the academic

Table 4. Models of Regression Using Actual Data

	(1)	**(2)**	**(3)**
Constant (p-Value)	0.699 (0.752)	-12.495 (0.000)	-19.388 (0.000)
FallAQPR	0.322 (0.013)	0.367 (0.000)	0.356 (0.000)
SprAQPR	0.633 (0.000)	0.578 (0.000)	0.564 (0.000)
FallINT		0.214 (0.007)	0.237 (0.006)
WinINT		0.207 (0.009)	0.163 (0.116)
SprINT		0.116 (0.139)	0.150 (0.095)
FallPE		-0.008 (0.912)	0.172 (0.120)
SprPE		0.093 (0.228)	-0.062 (0.454)
WordenWhirl		0.239 (0.005)	0.141 (0.078)
FallDrill			0.072 (0.407)
SprDrill			-0.053 (0.489)
ZoneINS			0.107 (0.105)
FallYP			0.009 (0.917)
SprYP			0.122 (0.176)
FSemCAP			0.131 (0.171)
SSemCAP			0.110 (0.079)
MonMash			0.034 (0.602)
Adj. R^2	0.660	0.880	0.928
F-stat	29.145 (0.000)	27.489 (0.000)	24.420 (0.000)
n	30	30	30

a. Dependent Variable: Final Color Company Rank 2005

measures were vastly more positive and significant in the analysis (intuitively expected from the algorithm). In addition, the F-statistic is again large (24.420) and significant to the 0.01 level showing that the model provides a strong explanation of the variance in the rankings.

When model (3) is reevaluated using the accumulated color points as the dependent variable against the individual measure point values, the R^2 becomes 1.000 and the coefficients for the individual independent measures represent their individual percentile impact on the competition. Conducting the majority of the analysis using the ranking scheme allows for a simplified review of the algorithm and provides valuable information regarding the relative importance of each of the three measurement categories. It also simply validates that the Naval Academy's instruction is being adhered to in general.

2. Actual versus Directed Measure Results

A comparison between the actual measures used versus those elements directed by the approved instruction is necessary to verify the validity results from the previous portion of the analysis. Currently (and contrary to the instruction), the competition algorithm includes multiple semesters of YP and CAP results (fall and spring semester) while not taking in account wargaming (defunct program) and professional course grades (NN204 and NS100, now incorporated solely in semester AQPR).

Predicted rankings were established according to directed guidance including the professional course results. Table 5 displays the difference between the actual Color Company rankings of the 2005 academic year and

the predicted values per the appropriate Naval Academy instruction (USNA, 2001).

Table 5. Comparison of Actual Ranking versus Instruction-Based Ranking

CO #	Actual Color Company Ranking	Ranking According to Directed Instruction	Difference
23	1	1	0
19	2	2	0
8	3	3	0
15	4	6	+2
28	5	7	+2
18	26	26	0
2	27	28	+1
24	28	27	-1
10	29	29	0
3	30	30	0
Difference	0	10 companies	33.3%
	1	7 companies	23.3%
	2	9 companies	30%
	3	3 companies	10%
	4	1 companies	3.3%

The largest difference within the Brigade between actual and predicted values was four positions with 33% (ten companies) matching positions. Differences of less than two positions were observed in over 86% of the cases. These results may not be typical and, without appropriate historical records, attaching only an assumption of annual representation to these results is prudent. However, with limited difference observed in comparison with directed

guidance, it is apparent that the presently instituted algorithm appropriately and validly recognizes deserving performance at the Naval Academy according to the original instruction; the broad intent of the instruction is being adhered to through current procedures.

3. Potential Motivation Indices

Relating to lengthy discussion within the current literature, analysis of resultant motivation stemming from provided incentives must be conducted. Rewards for performance at the Naval Academy, directly linked to the Color Company Competition, include both group (parking and liberty privileges, recognition) and individual (memorial trophies and swords) centered awards. These incentives can induce both intrinsic and extrinsic motivation, but improved outcome performance from the individual team member is the desired 'bottom-line' by the institution. A comparison of academic performance changes within a company prior to and during recognition as the Color Company is potentially useful to measure motivation. This analysis can also demonstrate the undesired effect of shirking within groups.

Table 6 shows the relationship between academic performance and recognition as the Color Company. Additionally, the changes in company performance were compared to changes in Brigade performance over the same time period (illustrated in Table 6 within parentheses). During the period reviewed by this study, four of five companies designated as the 'best' within the Brigade displayed lesser performance as a company during the following year (the 'award phase'). The mean decrease in academic AQPR of those four companies was 0.069. The one

year that showed an improvement in AQPR of the Color Company (AY2004, 14th Company), was only an improvement in AQPR of 0.015.

In this evaluation, all five companies demonstrated a negative trend in performance when compared to average Brigade performance. For example, 16th company's AQPR in 2003 was 3.029. In comparison, the average Brigade AQPR was 2.944, creating a 'difference' AQPR of 0.085. In 2004, 16th company achieved an AQPR of 2.852 which was outperformed by the Brigade average (2.943) by 0.091 yielding a two year effective decline in AQPR of 0.176. Simply put, in comparison to average Brigade performance, 16th company's AQPR (academic measure of performance) declined by 0.176 from the time the company was recognized as the Color Company to the completion of its respective award phase.

Despite the limited historical records available, Color Company recognition during the academic years 2001 to 2005 appears to either:

- Positively affect individual company motivation and, thus, improve company performance during the competition
- Negatively affect individual company performance during the 'award phase' once the company has received recognition and is enjoying the benefits of their previous success
- Potentially stimulate the effect of shirking within a company

Table 6. Color Company Designation Effects on Academic Performance

CO #	AY2001 AQPR	AY2002 AQPR	AY2003 AQPR	AY2004 AQPR	AY2005 AQPR	AY2006* AQPR
Brigade Average	2.929	2.900	2.944	2.943	2.977	2.990
10	2.957 (0.028)	2.905 (0.005)				
5		2.957 (0.057)	2.955 (0.011)			
16			3.029 (0.085)	2.852 (-0.091)		
14				2.97 (0.027)	2.985 (0.008)	
23					3.019 (0.042)	2.973 (-0.017)
Color Company Change		-0.052	-0.002	-0.177	0.015	-0.046

***AY2006 only includes fall semester data**

3. Brigade Climate Survey Results

The Brigade Climate Survey is the Naval Academy's attempt at directly measuring midshipmen perceptions of morale and satisfaction. Correlations between the specific questions chosen, as detailed in Chapter III, are seen in Table 7. As expected, all of the questions displayed strong positive association (and statistical significance) with one another. The significance issue is also important because the outcome of the test incorporated two-tailed significance results but, in reality, the results should include only a one-tailed significance based upon the nature of the posed questions.

The highest correlation in this analysis was found to be between Question 46 (I enjoy being a member of this

company) and the results of the company morale question (both high (0.901) and low (0.822), respectively). High

Table 7. Brigade Climate Survey Correlations

		1	2	3	4	5
1. Q. 3 Brigade Climate Survey Rank	Pearson Correlation	1				
	Sig. (2-tailed)	.				
2. Q. 6 Brigade Climate Survey Rank	Pearson Correlation	.674 (**)	1			
	Sig. (2-tailed)	.000	.			
3. Q. 10 Brigade Climate Survey Rank	Pearson Correlation	.641 (**)	.644 (**)	1		
	Sig. (2-tailed)	.000	.000	.		
4. Q. 46 Brigade Climate Survey Rank	Pearson Correlation	.532 (**)	.791 (**)	.701 (**)	1	
	Sig. (2-tailed)	.002	.000	.000	.	
5. High Morale Rank - Brigade Climate Survey	Pearson Correlation	.638 (**)	.762 (**)	.675 (**)	.901 (**)	1
	Sig. (2-tailed)	.000	.000	.000	.000	.
	N	30	30	30	30	30

**** Correlation is significant at the 0.01 level (2-tailed).**

morale was indicated by survey answers that were four or five and low morale was denoted by answers of one or two. These results provide indication of multicollinearity between Question 46 and the morale question. Based on relevance to this study, morale (and specifically high morale) was included in the data analysis.

Tables 8 and 9 illustrate the OLS analyses of the Brigade Climate Survey results with respect to the actual final Color Company rankings and the predicted Color Company rankings. Although the only statistically significant item in both regressions was determined to be the constant ($p < 0.01$ in both cases), interesting results were observed.

Table 8. Brigade Climate Survey versus Actual Final Color Company Ranking Coefficients

	Unstandardized Coefficients		t	Sig. (2-tailed)
	B	Std. Error		
Constant	11.853	3.460	3.425	0.002
Q. 3 Brigade Climate Survey Rank	0.452	0.279	1.624	0.118
Q. 6 Brigade Climate Survey Rank	-0.531	0.325	-1.634	0.115
Q. 10 Brigade Climate Survey Rank	0.425	0.272	1.566	0.130
Q. 46 Brigade Climate Survey Rank	-0.068	0.482	-0.141	0.889
High Morale Rank - Brigade Climate Survey	-0.043	0.445	-0.097	0.923

a. Dependent Variable: Final Color Company Rank 2005

From Table 8, two questions (3 and 10) demonstrated positive effects on the competition whereas questions 6 and 46 as well as the results of the morale question indicated negative effects. Question 3 (The midshipmen chain of command is working hard to make my company the best in the Brigade) and 10 (The midshipmen company leadership recognizes people who deserve it) relate to the midshipmen chain of command and the company's apparent drive for success. Question 6 (My company chain of command promotes teamwork) and 46 (I enjoy being a member of this company) are the two queries directly involving teamwork and belongingness. An effect of multicollinearity appears to be present between Question 46 and the company morale question and is supported by the previously noted extreme correlation.

Table 9. Brigade Climate Survey versus Predicted Final Color Company Ranking Coefficients

	Unstandardized Coefficients		t	Sig. (2-tailed)
	B	Std. Error		
Constant	12.325	3.566	3.456	0.002
Q. 3 Brigade Climate Survey Rank	0.301	0.287	1.050	0.304
Q. 6 Brigade Climate Survey Rank	-0.492	0.335	-1.469	0.155
Q. 10 Brigade Climate Survey Rank	0.434	0.280	1.550	0.134
Q. 46 Brigade Climate Survey Rank	-0.253	0.497	-0.509	0.616
High Morale Rank - Brigade Climate Survey	0.214	0.458	0.468	0.644

a. Dependent Variable: Predicted Color Company Rankings 2005

The resultant coefficients observed in Table 8 for questions 3, 6, and 10 are of comparable orders of magnitude while the question of company morale and question 46 are essentially negligible according to the regression coefficients. These results are not statistically significant (though questions 3 and 6 are nearly statistically significant, one-tailed $p = 0.06$ for both variables) and no concrete conclusions should be developed from these results since this analysis only includes one year's worth of information. Despite this fact, however, it is interesting how these results could be indicative that the competition results themselves (and, by definition, the actual competition) may not promote or encourage attributes of teamwork and cohesion. Another interesting explanation of the negative coefficient for Question 6 is that leadership personnel may have to work much harder promoting teamwork within a company that is not currently working well as a team. These efforts may be resisted by the general midshipmen population and deemed as counterproductive and ineffectual.

Table 9, Brigade Climate Survey results versus Predicted rankings, reveals similar results to Table 8. The first regression, Table 8, yielded an R^2 value of 0.28 while the second regression generated a comparable R^2 value of 0.249. The relationship between the predicted rankings and high company morale is the only truly different result (positive effect vice negative effect). Again, this outcome is not statistically significant, though it would appear to indicate that the predicted rankings (produced in adherence to the published instruction) are positively affected by the morale within a company.

The effect of multicollinearity between Question 46 and the company morale query during regression analysis is eliminated once those variables are removed. Table 10 illustrates the results of a final regression between the dependent variable of Final Color Company Rank 2005 and questions 3, 6 and 10 of the Climate Survey. This analysis yields an R^2 value only slightly less than Table 9 with two less variables. Questions 3 ($p = 0.036$) and 6 ($p = 0.011$) are now both statistically significant (one-tail $p = 0.055$ for Question 10).

Table 10. Brigade Climate Survey (Q. 3, 6, 10) versus Final Color Company Rankings Coefficients

	Unstandardized Coefficients		t	Sig. (2-tailed)
	B	Std. Error		
Constant	11.657	3.283	3.551	0.001
Q. 3 Brigade Climate Survey Rank	0.457	0.243	1.882	0.071
Q. 6 Brigade Climate Survey Rank	-0.597	0.243	-2.452	0.021
Q. 10 Brigade Climate Survey Rank	0.388	0.234	1.655	0.110

a. Dependent Variable: Final Color Company Rank 2005

C. CHAPTER SUMMARY

This chapter provided the results of various OLS regression analyses that were conducted during the course of this study. Regression (3) helped to demonstrate support for the posed null hypothesis (H_o) that the current procedures in use at the Naval Academy for determination of the 'best' company within the Brigade appear valid. Consequently, this study must reject the alternate hypothesis (H_a) that the current procedures are invalid.

Additional analysis was conducted to determine the motivational effects (and possible resultant shirking) that are observed within companies that benefit from the Color Competition rewards process. The analysis revealed that 80% (four companies in five years studied) generated weaker performance during the award phase of the competition detailing a concern that a sense of 'resting on laurels' or shirking may occur after successful outcomes without further motivation.

This chapter also provided analysis of the interaction between the morale and teamwork perceived within a company by individual midshipmen and the outcome performance of those companies (based by Color Competition rankings). The limited significance and sometimes even negative effect (noted by regression coefficients) of the chosen survey questions would tend to exhibit little or no useful relationship between a company's climate and achieved performance. The limited number of cases (n= 30) provides a valid explanation for the low levels of statistical significance; the magnitude and sign of various coefficients provide an interesting insight to the survey's predictive ability toward performance. Later analysis of upcoming climate surveys should provide additional data that can be used to verify trends observed from these early reference points.

The final regression that does not include Question 46 and the company morale question demonstrated statistical significance for the remaining questions (Q. 3, 6, 10), removing negative effects of multicollinearity from the analysis. These results were overall unanticipated, especially when compared to that expected from the literature review; an effect that may be attributed to the

limited historical reference of the survey (presented to the Brigade initially during the 2005 academic year). Later years may yield outcomes that are more intuitive or simply provide more data that is disparate with the current literature.

THIS PAGE INTENTIONALLY LEFT BLANK

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

The purpose of this research project was to assess the validity of the Color Company Competition at the United States Naval Academy. First, the Academy and its mission were introduced. Congress and the American people have charged the Naval Academy to develop Navy and Marine Corps officers of character and ability from midshipmen for the past 160 years. The study briefly introduced the Color Company Competition itself. This annual competition is a statistics-based performance measurement tool used to resolve the 'best' company within the Brigade of Midshipmen.

The next section, a comprehensive review of current literature, began by expounding upon the Color Competition concept. This description of the competition included review of an additional incentive-based tool, the Company Incentive Program, in addition to discussion of important aspects to this study such as: teams and teamwork, cohesion and morale, motivation and incentives. This section then described various models currently advocated within the performance measurement community. Finally this section provided a more in-depth glimpse into the constructs of 'morally, mentally and physically' and military professionalism.

The literature review provided specific guidelines for effective performance measurement models:

- Explicit Direction – sufficient structure must be provided to ensure that teams and team members

understand what the institution considers as important goals (“what gets measured, gets done”)

- Appropriate Focus – adequate emphasis placed on group or collective goals in order to make them seem equally important to individuals and the organization
- Sufficient and Meaningful Incentives – incentive-based programs must be relevant to create desired results (increased motivation and morale, and thus performance)

The third section, research methodology, described the processes used to conduct this research project. The chapter began by explaining the specific sources of the data used and then later clarifies the procedures used to manipulate the data into useful information. The results section of this study included outcomes of different regression analyses. From this, the predictive validity was supported according to the actual (not necessarily the directed) variables used to calculate the competition.

The rest of this chapter details the specific conclusions and recommendations developed throughout the course of this research project.

B. CONCLUSIONS

The Color Company Competition performance measurement procedures are currently inadequate despite the appearance of validity. The validity support garnered from the regression analyses can be attributed to reviewing the measures that were actually used during the competition vice those measures that are directed for use by the institution’s administration (USNA, 2001). The validity,

though, was also demonstrated during the comparison analysis between generated rankings using both sets of measures (actual and directed). These results can be ascribed to the insignificant magnitude of the measures no longer utilized (wargaming, etc.) as well as the very large (even skewed) influence of academic performance on the competition results. An additional explanation of these results would be that due to the 'whole person' effect of general cognitive ability, the competition's simple inclusion of academic measures accounts for other 'unseen' factors (Schmidt & Hunter, 2004); cognitively 'gifted' individuals tend to perform better at many additional functions outside of academia. The analysis results from the first regression (p. 46) show that the academic measures appear to account for 66% of the variance in the competition. These results, despite the direct keying for 33%, would indicate that the effect of the academic measures creep into other performance criteria.

Further evaluation of the Naval Academy's performance measuring tool must center around essential keys to performance improvement (Addison, 2004): structure (clearly defined and communicated routines), motivation (feedback and incentives), and environment (provision of resources). The importance of effectively communicating the Naval Academy's performance expectations to the Brigade of Midshipmen can not be stressed enough. Common, worthwhile, and achievable goals are very important to giving direction to an individual's exertion of effort. The current incentive plans in operation at the Academy (the Color Company Competition and the Company Incentive Program) provide competing values despite seemingly being

equivalent performance measurements. Due to the outdated nature of the current Color Company instruction, clarity of mission is further reduced; without developing clear and direct guidance, a perception of ‘garbage in, garbage out’ is fostered, diminishing the positive goals of the competition itself.

Motivation has been proven an integral aspect of performance. This motivation can either be provided extrinsically or intrinsically and can also be positive or negative. In order to create a useful performance measurement tool that utilizes incentive-based outcomes, the motivation must be individually important and significant, or simply “fit the crime” (Arce & Gunn, 2005, p. 128) relative to performance. Relevant group rewards such as liberty can drive individual midshipmen to invest greater effort into team goals thereby producing an improved outcome performance.

At the conclusion of each year’s competition, feedback should also be used to stimulate future performance whereas at the current juncture, no feedback is given except for the overall winner; 1 company receives feedback while the other 29 do not (other than work harder next year). Furthermore, once a company has ‘lost’ the competition, an entire year must pass before the chance for success presents itself again. The issue of feedback from the competition would partially be corrected through intermittent updates briefed or provided to the Brigade. An additional feedback tool would be to include different measures gauged during the competition that incorporate changes in company performance from one competition period to the next.

The development of an environment where the Color Company Competition is similarly important to both the participants and the institution becomes the most difficult aspect of improvement. The concept of providing sufficient focus on the competition and providing midshipmen the resources necessary to best develop team cohesion requires buy-in from not only the midshipmen but also the administration. Currently little communication (related to the issue of feedback) is provided to the Brigade from the administration regarding the competition except for the final report of the Color Company during the Color Parade events. Progress reports and displays, again, can present company status throughout the academic year, expressing the importance that the institution places on the competition results. This is further compounded by the issue of turnover that occurs at the end of each academic year; first class midshipmen graduate and other classes may be moved into new companies.

The effectiveness and value of any incentive-laden plan lays in ensuring that the punishment or reward is appropriate. An organization can ascertain from this adage that without an appropriate emphasis on effectively measuring what is expected and rewarding groups accordingly, what ‘gets done’ may not be exactly what the institution wants or needs.

C. REVIEW OF POSED RESEARCH QUESTIONS

1. Primary Research Question

What is the predictive validity of the algorithm used to select Color Company?

According to the results, evidence supports the stated null hypothesis that the current procedures in place for

determining the Color Company at the Naval Academy are valid. The analysis indicated that there were statistically insignificant ($p > 0.05$) measures included in the competition's algorithm (i.e. PE Grades, Drill, YP results). However, these variables are still necessary based upon the intent of the program which measures and seeks to stimulate the 'well-rounded' development of midshipmen. Additionally, with only a small amount of difference (as noted by Table 5 of Chapter IV) between the final published competition rankings and the rankings predicted by the directed instruction (USNA, 2001), companies were ranked sufficiently. However, despite the measure of validity, it is apparent that the performance measurement tool does require updating and include more specific guidance to more effectively elicit the desired results.

2. Secondary Research Questions

Should professional, athletic, and academic development be equally weighted in the selection of color companies?

The Naval Academy gears its mission and strategic plans toward the three tiers of mental, physical, and professional development of midshipmen. As an academic institution, it would seem intuitively obvious that the academic mission of the organization should outweigh any other outside considerations. However, as the primary source of officers for the United States Navy and Marine Corps, physical and professional training become essential to determining the success of the institution and its graduates. By this reasoning, equal weighting should be used between the three tiers.

This is currently accomplished per the direction guiding the Color Company Competition. One caveat to this statement is that, though each category is weighed as a whole equally, individual weighting of subcategories appear to be significantly skewed. This is readily observable within the academic measure portion of the competition. The only two subcategories of academics are fall and spring semester AQPR. The category itself is weighed at 33.3 percent of the whole competition yielding a subcategory weight of 16.7 percent for each semester's AQPR. The next highest subcategory percentage yield is for seasonal intramural performance (8.4 percent). The trouble with this type of skewed weighting scheme is that companies that are academically weaker than others can nearly be eliminated from the competition based solely on one measure despite possible excellence in other measures, thus effectively reducing performance.

The unexpected results from the first regression analysis (p. 46) emphasize the apparent academic 'skew' of the competition. The R^2 value of 0.66 demonstrates that 66% of the variance in the competition results are explained by the two academic inputs. The second regression, including the physical measures, generated an R^2 of 0.88 revealing that the new variables only account for 22% (vice the prescribed 33%). The final regression included all variables currently employed during the competition and produced an R^2 value of 0.928. This small change (0.048) can be solely attributed to the professional measures, revealing that less than 5% of the current competition's variance is exclusively accounted for by military performance.

Contrary to expectations of equality, data analysis revealed that two-thirds of the competition outcome is currently attributed to academic performance while physical performance accounts for less than one third and military professionalism appears nearly statistically negligible. Assuming the Academy apparently advocates parallel importance to academic, physical and professional endeavors, the current algorithm requires alteration to more equally evaluate resultant performance. This is crucially important in rebuilding military professional as a cornerstone measure of performance (from 5% to approximately 33%).

Does the reward system currently in-place provide effective motivation for companies to strive for Color Company status?

At this time, only the Color Company receives any benefit from the results of the competition. The award period consists of the entire academic year following the acknowledgement of the company's performance. Those incentives include special markings on the company guidon (flag), improved parking privileges, special memorial awards presented to the company's midshipmen leadership (company commanders), as well as other various group awards.

An 'all-or-nothing' mentality develops from only rewarding the top company while the other twenty-nine 'go without'. If a company determines their chances of reaching the number-one ranking within the Brigade as low or essentially zero, little motivation for success is fostered other than for personal gain (leading to potential selfish behavior). Individual assessment of cost versus

reward would unlikely be comparable to that expected by the administration. Currently, this is an especially counterproductive development if a company makes this decision because of the length of the reward period and, thus, the time until the next chance that another company will be chosen as the Color Company.

A more equitable reward system would include a graduated incentive plan where not only a ranking of number-one would see the ‘fruits’ of a semester’s labor. The top company would still be acknowledged as the Color Company and would receive the appropriate benefits relating to that performance level. Other ‘outstanding’ companies (the next five companies for instance) would receive comparable, though lesser, benefits. The next group of ‘excellent’ performers would again gain benefits above a certain base level but less than outstanding performers. The final group of ‘satisfactory’ companies would receive the base level of privileges according to current Naval Academy directives.

Is there a way to combine an incentive program that is currently in-place with the Color Company Competition effectively, creating a tangibly relevant measurement tool?

The simple answer to this final research questions is: yes. The first recommendation postulated by this study details the benefits and possible make-up of such a combined program.

D. RECOMMENDATIONS

1. Intertwine Programs: Color Company Incentive Program

The most substantial recommendation provided from this study regarding performance measurement tools at the Naval

Academy is to meld the two current programs into one singular and all-inclusive program: the Color Company Incentive Program.

The existence of two separate and distinct performance measurement tools that are ‘supposedly’ measuring the same entity is at best redundant and wasteful; at worst, confusing and counterproductive. The Company Incentive Program receives a much higher valuation amongst members of the Brigade as both the more recent initiative and as inclusive of the most ‘appreciated’ (liberty-based) incentives. A combined program can bring both the history of the Color Company Competition, revered and expected by alumni, and the desired incentives of the Company Incentive Program, maximizing the potential motivational benefit to performance improvement.

The length of the reward period (currently one year) de-motivates ‘non-color’ companies from improving in the short term. A shorter reward time presents a more time-responsive look at the performance of companies. Many of the measures used during the currently installed measurement devices are semester-based events and those that are not have counterparts that are comparable in the alternate semester to act as replacements. For example, AQPR is measured in both the fall and spring semester. The Worden Whirl and Monster Mash are not run during the fall semester but those measures can be offset by increasing the value of other fall semester activities such as spirit competitions.

An additional concern, and linked directly to the previous point of reward length, determined during the analysis of the data was the visibility of shirking done by

companies enjoying the benefits of being designated as the Color Company. By measuring simple statistics involved with performance, changes in performance can often be overlooked. Inclusion of improvement factors (displaying both positive and negative improvement marks) will demonstrate the current effectiveness of company members in the areas of concern.

Recognition of the Color Company can be done bi-annually (possibly at the Army-Navy Football game in December and during the Color Parade in May). The privileges for designation of Color Company will last for the semester following the presentation and end upon the declaration of the next semester's winner. Rewards normally presented to the company commanders of the Color Company during the Color Parade can be duplicated for the fall presentation.

Administering the liberty-based incentive of the program should be similar to the process employed by the Company Incentive Program. Upon ranking the companies according to the desired quantifiable measures, the top companies (20 percent, 6 companies) are rated as 'outstanding', the next group of companies (30 percent, 9 companies) are rated as 'excellent', and the final group (50 percent, 15 remaining companies) rated as satisfactory.

Table 11. Color Company Incentive Breakdown

Category	Measure	Fall (%)	Spring (%)
Professional	Drill	7.5	7
	Zone Inspection	6	6
	YP Competition	3.5	3.5
	CAP	4	4
	4/C Professional Quizzes	5	5
	Conduct Offenses	3.5	3.5
	Conduct Grades	1.5	1.5
	BSA Participation	2.5	2
	Sub-total	*33.5*	*32.5*
Academic	Avg SQPR	12.5	12.5
	Avg SQPR in Prof. Courses	9	9
	% Change of Avg SQPR	5.5	5.5
	Academic UAs	7	7
	Sub-total	*34*	*34*
Physical	Intramural Standing	10	9
	Ave PE Grades	9	8
	Worden Whirl	0	3
	Monster Mash	0	3
	PRT Pass Rate	8	7
	Spirit Competitions	5.5	3.5
	Sub-total	*32.5*	*33.5*
Total		100	100

2. Foster Esprit de Corps

Recently, year groups within companies at the Naval Academy are sometimes shuffled or shot-gunned. Shuffling is when a year group from one company moves to another

company as a whole (i.e. 15th company youngsters become 2nd company second-class). ‘Shot-gunning’ is when a year group from one company is broken up such that individuals move to different companies throughout the brigade (i.e. one or two plebes from 15th company are moved into each of the other 29 companies). The benefits of these midshipmen movements are that the midshipmen meet more of their classmates and the Brigade as a whole and that midshipmen who need a ‘second chance’ will receive one in their new companies.

Alternatively, however, company ‘shuffling’ and ‘shot gunning’ break up the team cohesion that develops over the course of a year, especially during plebe (freshman) year. After spending two semesters, more in some cases, working and motivating one another to achieve greater performance, the ‘team’ is divided up and placed in new environments (companies). Additionally, the ‘break-up’ of company unity can develop motivation losses when a team excels and earns Color Company recognition over the course of the year, certain midshipmen may be transferred out and, thus, not receive the benefits from the achievement. In this instance, the ‘cost’ of team work receives no benefit thereby limiting future effort.

Currently, the Brigade consists of only the class of 2006 that was moved in such a manner (shuffled). The three underclasses (2007, 2008, and 2009) have maintained their company ‘identities’ thus far. The effect of company ‘break-ups’ are Brigade-wide when they occur and though that would indicate that each company remains on a level playing field, that field is still lower than may be necessary. First class midshipmen (seniors) graduate each year removing 25% of a company’s population every

year. By displacing an additional class from a company, that percentage rises to 50% meaning that one-half of a company may not benefit from a previous year's exceptional display teamwork and performance. It is therefore recommended that, and based solely upon the negative consequences to the Color Competition, this policy of maintaining personnel in one company for the entirety of their time at the Naval Academy is continued.

Additionally, certain steps can be taken to provide further cohesion and camaraderie within a company. Midshipmen wear company logo patches on certain uniform jackets. This type of identification instills a sense of unity with company-mates as jerseys do with sports teams. Moving this concept forward could include:

a. Company numbers or logos placed on blue-rim (Physical Education) shirts and the uniform reversible mesh jersey.

b. Including patches on academic bags that presently only include the Naval Academy's crest.

c. Increasing the visibility and recognition of spirit competitions that occur throughout the year (i.e. the dodgeball competitions held during the basketball season or the sheet posters of the football season).

3. Make Incentives Individually Relevant

Relevant incentives generally provide extrinsic motivation to personnel. Individually relevant incentives can shift that motivation more towards an intrinsic impetus, improving the amount of 'buy-in' an individual has and, therefore, the performance output (Stiffler, 2006). Incentives affecting midshipmen personally will illicit a

greater amount of participation (despite the competition being a measure of team performance). This increased rate of participation in the process thereby improves the overall team performance (Scott & Tiessen, 1999).

Changes to the individual merit systems installed at the Academy can place importance on team performance. For instance, the Military Order of Merit (MOOM) currently includes: Military Performance (44.56%), Conduct (19.66%), Professional Courses (10.48%), Physical Education (16.78%), and Athletic Performance (8.52%). The MOOM can be restructured to include a factor related to Company Performance. This new factor, possibly weighed at 5% of the total MOOM, would be resolved by ranking the companies according to the results of the Color Company Incentive Program. Table 12 illustrates the recommended change to the MOOM.

Table 12. Military Order of Merit Breakdown

	Current Breakdown	**Proposed Breakdown**
Military Performance	44.56%	44%
Conduct	19.66%	20%
Professional Courses	10.48%	11%
Physical Education	16.78%	
Athletic Performance	8.52%	
PE/Athletic Performance		20%
Company Performance		5%
Overall	100%	100%

4. For Further Research

The dimensions of company make-up (heterogeneous demographics) and the randomness associated with placing personnel into companies (the essentials on how a company is formed) do not appear to have been reviewed or researched at the Naval Academy. A review of these parameters at the Academy would provide an understanding to the administration as to the ‘levelness of the playing field’ between the companies within the Brigade.

LIST OF REFERENCES

Addison, R. M. (2004). Performance Architecture: A Performance Improvement Model. Performance Improvement, 42 (6), 14-16.

Amsterdam, C. E., Johnson, R. L., Monrad, D. M., & Tonnsen, S. L. (2003). A Collaborative Approach to the Development and Validation of a Principal Evaluation System: A Case Study. Journal of Personnel Evaluation in Education, 17 (3), 221-242.

Anderson, J. R. (2005). The Relationship Between Student Perceptions of Team Dynamics and Simulation Game Outcomes: An Individual-Level Analysis. Journal of Education for Business, 81 (2), 85-90.

Arce, D. G. & Gunn, L. B. (2005). Working Well with Others: The Evolution of Teamwork and Ethics. Public Choice, 123 (1), 115-131.

Arnold, H. J. (1985). Task Performance, Perceived Competence, and Attributed Causes of Performance as Determinants of Intrinsic Motivation. The Academy of Management Journal, 28 (4), 876-888.

Bartone, P. T. (2002). Cognitive and Personality Predictors of Leader Performance in West Point Cadets. Military Psychology, 14 (4), 321-338

Bollen, K. A. & Hoyle, R. H. (1990). Perceived Cohesion: A Conceptual and Empirical Examination. Social Forces, 69 (2), 479-504.

Brannick, M. T., Salas, E., Prince, C. (1997). Team Performance Assessment and Measurement. Mahwah, N.J.: Lawrence Erlbaum Associates, Inc.

Campbell, J. P. (1994). Alternative Models of Job Performance and their Implications for Selection and Classification. Personnel selection and classification (pp. 85-102). Hillsdale, NJ: Lawrence Erlbaum Associates.

Chung, K. H. (1968). Developing a Comprehensive Model of Motivation and Performance. The Academy of Management Journal, 11 (1), 63-73.

Chyung, S. Y. (2005). Human Performance Technology. Performance Improvement, 44 (1), 23-28.

Clark, R. E. (March 2004). The "ten most wanted" motivation killers. PerformanceXpress, International Society for Performance Improvement.

Clark, R. E. (2005). Five Research-Tested Team Motivation Strategies. Performance Improvement, 44 (1), 13-16.

Clark, T. M. (2004). Moral Development at the United States Naval Academy: The Midshipman's Perspective. Thesis, Naval Postgraduate School.

DeNisi, A. S. (2000). Performance Appraisal and Performance Management. In S. Zedeck (Ed.), Multilevel theory, research, and methods in organizations: foundations, extensions, and new directions (pp. 121-156). San Francisco: Jossey-Bass.

Dickinson, D. L. & Isaac, R. M. (1998). Absolute and Relative Rewards for Individuals in Team Production. Managerial and Decision Economics, 19 (4/5), 299-310.

Evans, J. S. (2002). A Qualitative Analysis Of The Performance Measurement and Outcome Management Procedures Applied To The Plebe Summer Program At The United States Naval Academy. Thesis, Naval Postgraduate School.

Frost, B. (2000). Measuring Performance. Dallas: Measurement International.

Gerdes, D. A. (2001). Leadership Education: Physical Activity and the Affective Domain. Physical Educator, 58 (2), 52-61.

Greelees, I., Lane, A., Thelwell, R., Holder, T., & Hobson, G. (2005). Team-Referent Attributes Among Sport Performers. Research Quarterly for Exercise and Sport, 76 (4), 477-487.

Guzzo, R. A. & Dickson, M. W. (1996). Teams in Organizations: Recent Research on Performance and Effectiveness. Annual Review of Psychology, 47, 307-338.

Guzzo, R. A. & Shea, G. P. (1992). Group Performance and Intergroup Relations in Organizations. In M. D. Dunnett & L. M. Hough (Eds.) Handbook of Industrial and Organizational Psychology (pp. 269-313). Palo Alto, CA: Consult. Psychol. Press. 2nd ed.

Hamilton, B. H., Nickerson J. A., & Owan, H. (2003). Team Incentives and Worker Heterogeneity: An Empirical Analysis of the Impact of Teams on Productivity and Participation. Journal of Political Economy, 111 (3), 465-497.

Harbour, J. L. (1997). The Basics of Performance Measurement. New York: Quality Resources.

Hartog, D. N., Boselie, P., & Paauwe, J. (2004). Performance Management: A model and Research Agenda. Applied Psychology: An International Review, 53 (4), 556-569.

Hightower, R. L. (1944). A Sociological Conception of Morale. Social Forces, 22 (4), 410-415.

Kuncel, N. R., Hezlett, S. A. & Ones D. S. (2004). Academic Performance, Career Potential, Creativity, and Job Performance: Can One Construct Predict Them All? Journal of Personality and Social Psychology, 86 (1), 148-161.

Lauer, M. J. (2004). Evaluating Teams and Teamwork. Performance Improvement, 43 (8), 39-41.

MacCurdy, J. T. (1943). The Structure of Morale. New York: Cambridge University Press.

Manning, F. J. (1991). Morale, cohesion, and spirit de corps. In R. Gal & A. D. Mangelsdorff (Eds.), Handbook of Military Psychology (pp. 453-470). New York: John Wiley & Sons Ltd.

McCloy, R. A. (1990). A New Model of Job Performance: An Integration of Measurement, Prediction, and Theory. Thesis, University of Minnesota.

Mitchell, T. R. (1982). Motivation: New Directions for Theory, Research, and Practice. Academy of Management Review, 7 (1), 80-88.

Nalbantian, H. R. & Schotter, A. (1997). Productivity Under Group Incentives: An Experimental Study. The American Economic Review, 87 (3), 314-340.

Onyett, S. (2004). The Joy of Wading: Leadership and Team Working in Swampy Conditions. The Mental Health Review, 9 (3), 35-41.

Polk, C. J. (2003). Effective predictors of submarine junior officer technical competence. Thesis, Naval Postgraduate School.

Pope, A. U. (1941). The Importance of Morale. Journal of Educational Sociology, 15 (4), 195-205.

Robbins, R. A. (2004). Retention of Recruited Athletes from the United States Naval Academy. Thesis, Naval Postgraduate School.

Rogers, J. D. (2003). Midshipmen Military Performance as an Indicator of Officer Fleet Performance. Thesis, Naval Postgraduate School.

Rouse, K. A. G. (2004). Beyond Maslow's Hierarchy of Needs: What Do People Strive For? Performance Improvement, 43 (10), 27-31.

Schmidt, F. L. & Hunter, J. (2004). General Mental Ability in the World of Work: Occupational Attainment and Job Performance. Journal of Personality and Social Psychology, 86 (1), 162-173.

Scott, T. W. & Tiessen, P. (1999). Performance measurement and managerial teams. Accounting, Organizations and Society, 24, 263-285.

Short, S. E. & Sullivan, P. J. (2003). Building, Maintaining, and Regaining Team Confidence in Sports. Journal of Physical Education, Recreation & Dance, 74 (1), 45-55.

Slavin, R. E. (1984). Students Motivating Students to Excel: Cooperative Incentives, Cooperative Tasks, and Student Achievement. The Elementary School Journal, 85 (1), 53-63.

Sosik, J. J., Potosky, D., & Jung, D. I. (2002). Adaptive Self Regulation: Meeting Others' Expectations of Leadership and Performance. The Journal of Social Psychology, 142 (2), 211-232.

Stiffler, M. A. (2006). Incentive Compensation Management: Making Pay-for-Performance a Reality. Performance Improvement, 45 (1), 25-30.

Stolovich, H. D. (2000). Human Performance Technology: Research and Theory to Practice. Performance Improvement, 39 (4), 7-16.

Tompkins, E. & Jones, G. (1950). The Genesis of Morale. The School Review, 58 (3), 156-161.

Tonso, K. L. (2006). Teams that Work: Campus Culture, Engineer Identity, and Social Interactions. Journal of Engineering Education, 95 (1), 25-37.

Tosti, D. T. (2005). The Big Five: The Evolution of the Performance Systems Model. Performance Improvement, 44 (9), 9-13.

United States Naval Academy (2001). COMDTMIDN INSTRUCTION 3590.2B: Color Competition. [On-Line]. Retrieved February 17, 2006, from http://intranet.usna.edu/Commandant/comdtinst.htm

United States Naval Academy (2005). COMDTMIDNINST 5400.6H: Company Incentives Program. [On-Line]. Retrieved February 21, 2006 from http://intranet.usna.edu/Commandant/comdtinst.htm

United States Naval Academy (2006). United States Naval Academy Strategic Plan 2006. [On-Line]. Retrieved March 6, 2006 from http://www.usna.edu/StrategicPlan/StrategicPlan.html

VonMeter, K. (2004). Coaching Adolescent Athletes. Strategies, 17 (6), 17-19.

Zeitz, G. (1983). Structural and Individual Determinants of Organizational Morale and Satisfaction. Social Forces, 61 (4), 1088-1108.

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
   Ft. Belvoir, Virginia

2. Dudley Knox Library
   Naval Postgraduate School
   Monterey, California

3. Nimitz Library
   U.S. Naval Academy
   Annapolis, MD

4. Superintendent
   U.S. Naval Academy
   Annapolis, MD

5. U.S. Naval Academy
   Office of Institutional Research
   Annapolis, MD

6. Operations Office
   U.S. Naval Academy
   Annapolis, MD

7. U.S. Naval Academy
   Department of Physical Education
   Annapolis, MD

8. Professor Armando Estrada
   Washington State University
   Vancouver, WA

9. Professor Kurtis Swope
   U.S. Naval Academy
   Annapolis, MD

10. LT Derek S. Dryden
    Annapolis, MD