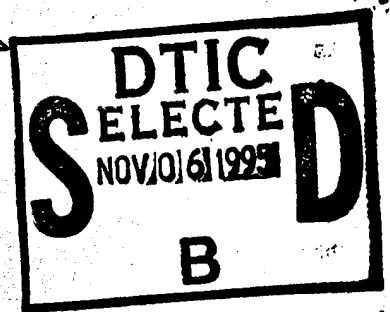




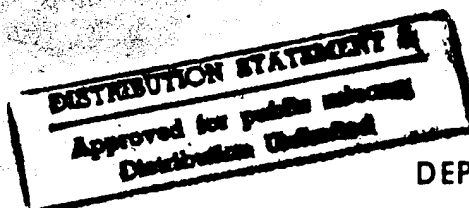
EFFECTS OF SITUATIONAL FACTORS
ON THE WORK PERFORMANCE
OF AERIAL PORT TECHNICIANS

THESIS

JOSEPH T. DOUGHERTY
CAPTAIN, USAF

AFIT/GTM/LAR/95S-5

DTIC QUALITY INSPECTED-8



DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

AFIT/GTM/LAR/95S-5

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THESIS

Presented to the Faculty of the Graduate School of
Logistics and Acquisition Management
Air Education and Training Command
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Transportation Management

Joseph T. Dougherty, B.S.,
Captain, USAF

September 1995

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Acknowledgments

I wish to express my sincere appreciation to my thesis advisor, Lt Col James R. Van Scotter, for his invaluable contributions to this thesis. I would also like to thank my reader, Dr. Robert P. Steel, for his efforts in helping me finish this project.

Appreciation is also extended to the men and women assigned to the 60th Aerial Port Squadron, Travis AFB, California for their time and patience during the data collection phase. They were all very cooperative and more than willing to help.

Finally, special thanks goes to Ms. Jonna Lynn Hamrick for her patience, encouragement, and much appreciated typing abilities.

Joseph T. Dougherty

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Abstract

This research investigated the impact of situational factors on aerial port productivity. Results showed constraints had little impact on performance. However, perceptions of constraints and performance were significantly related to individual differences in temperament.

EFFECTS OF SITUATIONAL FACTORS ON THE WORK
PERFORMANCE OF AERIAL PORT TECHNICIANS

I. Introduction

An individual's work performance is primarily a function of knowledge, skills, abilities, and other personal characteristics that contribute to or detract from effective functioning on the job (Dunnette, 1976) and environmental influences that may constrain or enhance performance (Peters & O'Connor, 1980). A prerequisite for improving individual and organizational effectiveness is that we learn more about the links between job performance, individual differences, and situational factors.

Prior Research On Situational Constraints

Researchers have suggested that situational factors are likely to influence performance in two ways. First, they can influence performance by imposing constraints that must be overcome (Naylor, Pritchard & Ilgen, 1980). For example, the environment can inhibit, interfere with, or limit the range of work behaviors that are effective. This type of a factor potentially affects task performance and the

is also true. Favorable environmental factors such as good facilities, training, and procedures may facilitate performance and make it possible for workers to perform effectively. Second, the environment can impact performance by influencing affective responses to the work setting (Naylor et al., 1980). For example, the work environment may provide information about the organization's reward system which subsequently arouses motives, affective reactions, and expectations that behaviors will lead to certain consequences. Figure 1 depicts a hypothetical constraints-outcome linkage.

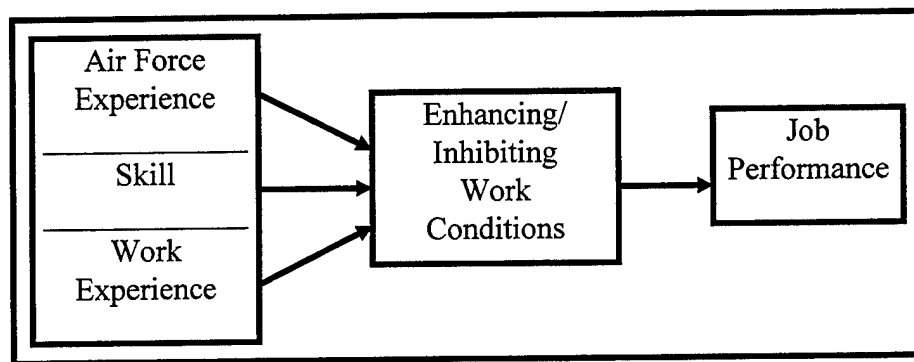


Figure 1. Constraints-Outcome Linkage

Peters and O'Connor's (1980) research sought to identify situational constraints that might: (a) directly and negatively affect work performance, and (b) moderate

ability/performance relationships. In a series of laboratory experiments, they demonstrated that situational constraints can adversely affect task performance and affective reactions to the job (Peters, Chassie, Lindholm, O'Connor & Kline, 1982; Peters, O'Connor, & Rudolf, 1980). An initial field study involving managers in civilian work settings found significant, but weak, relationships between overall constraint scores and supervisory performance ratings (O'Connor, et al, 1984). Small, but significant correlations were also obtained between constraint scores and performance ratings in an Air Force sample (Peters, O'Connor, Eulberg & Watson, 1988; Watson, O'Connor, Eulberg & Peters, 1983). Attempts to explain differences in the results obtained in laboratory and field studies have centered on two possibilities. The first is that few constraints seriously affect performance in "real" work situations, either because there are many ways to get the work done, or because laboratory experiments exaggerated the effects of constraints by denying access both to key resources and potential substitutes. The second approach suggests that raters providing performance criterion

measures in field studies somehow take into account or "allow for" differences in the constraints affecting different rates. Both approaches implicitly assume that workers perceive constraints in consistent ways, because constraints are measured by workers.

Peters and O'Connor (1980) proposed a taxonomy of eight situational variables necessary for task accomplishment. This general taxonomy included: (1) job related information, (2) tools and equipment, (3) materials and supplies, (4) budgetary support, (5) required services and help from others, (6) task preparation, (7) time availability, and (8) work environment. They called for further refinement of the taxonomy and additional research to develop an instrument capable of validly assessing the situational variables.

Steel and Mento (1986) investigated the degree to which performance constraints hindered managerial job performance. Four Likert-type items were developed to assess the extent to which task environments were perceived as constraint-laden or constraint-free. The items dealt with job induced obstacles, interpersonal or social obstacles, environmental

constraints, and constraints which stem from policies and procedures. Their work suggested the potential importance of individual differences in identifying and reporting constraints. Again, results indicated constraints had weak, but statistically significant, effects on work performance

These studies were informative in identifying possible constraint dimensions and in beginning to understand relationships between environmental variables and job performance, but failed to investigate the potential for situational factors to influence performance in a positive way. Previous research also defined the performance criterion in broad terms. If specific constraints affect performance it seems likely they would affect some aspects of performance more than others. Thus, performance measures designed to tap more specific performance criteria seem more likely to be influenced by specific constraints than general measures of performance. Finally, previous research indicates constraints have direct effects on affective responses. Employees who described their jobs as more constraining report less satisfaction and more frustration (O'Connor, et al, 1982). Recent work also suggests

differences in the way people perceive the environment. Optimists may see constraints as challenge or an opportunity to excel while pessimists may view them as threatening.

Positive Affect and Negative Affect Schedule (PANAS)

In recent studies, positive and negative affectivity have consistently emerged as two dominant and relatively independent dimensions. Positive Affect (PA) reflects the extent to which a person feels enthusiastic, active and alert. High PA is a state of high energy, full concentration, and pleasurable engagement, whereas low PA is characterized by sadness and lethargy. Conversely, Negative Affect (NA) is a general dimension of subjective distress and unpleasurable engagement that subsumes a variety of aversive mood states, including anger, contempt, disgust, guilt, fear, and nervousness, with low NA being a state of calmness and serenity (Watson, Clark & Tellegen, 1988).

PA and NA have been used in a variety of studies. Findings indicate the two factors relate to different classes of variables. NA--but not PA--is related to self-reported stress and (poor) coping (Clark & Watson, 1986; Kanner, Coyne, Schaefer & Lazarus, 1981; Wills, 1986),

health complaints, (Beiser, 1974; Bradburn, 1969; Tessler & Mechanic, 1978), and the frequency with which unpleasant events are experienced (Stone, 1981; Warr, Barter & Brownbridge, 1983). In contrast, PA--but not NA--is related to social activity, satisfaction and to the frequency with which people evaluate events as pleasant and positive (Beiser, 1974; Bradburn, 1969; Clark & Watson, 1986, 1988; Watson, 1988).

The Present Effort

Previous studies suggest that constraints exist in military organizations (Broedling, et al., 1980), and they have an important impact on performance. For example, in observational studies, Kane (1979, 1981) suggested as much as fifty percent of the work time of Air Force maintenance workers was spent coping with constraining work factors (O'Connor, Eulberg, Peters & Watson, 1984). Problems such as a lack of spare parts or poor support from supply in delivering those parts are examples of real world constraints affecting maintenance activities. It seems obvious that constraints would inhibit the ability of the technician to get the job done. When the part is not on the

flightline, or there is not time to do the job properly, or the required information cannot be found in the Technical Order, then all the training and motivation in the world will not make a difference (Campbell, 1985). Yet, research indicates only modest effects on work performance. This is puzzling because the idea that constraints affect performance receives overwhelming support from mid-managers.

One explanation for the lack of stronger research support is that previous studies used instruments that asked incumbents how accurately statements about constraints described their jobs, but never asked how much the constraints affected task accomplishment. It seems possible that some situational factors could be accurately described, but unimportant. While others might affect some aspects of performance positively on one occasion and negatively on another. Thus the primary objective of this thesis is to determine how much situational factors effect the performance of aerial port technicians and contribute to the academic theory of situational constraints. It represents the first systematic exploration of the impact of

constraining performance factors in an aerial port environment.

A second objective is to investigate the possibility that the accuracy of constraint statements and their impact (positively or negatively) on work performance are not strongly related. Finally, the study will examine the influence of individual differences in skill experience positive and negative affectivity on perceptions of constraints.

II. Literature Review

Constraints Research in Military Settings

Most of the research on constraints in military environments has focused on developing a taxonomy of major performance barriers experienced by workers. Researchers have studied the types of constraints confronting Air Force maintenance technicians (Kane 1979, 1981), the naval industrial community (Broedling, et al, 1981), and a variety of Air Force enlisted career specialties (O'Connor, Eulberg, Peters, and Watson, 1984).

O'Connor, et al (1984) investigated the effects of constraints on supervisory performance appraisals, self-ratings of job-satisfaction, and self-reports of intent to stay/quit for seven groups of Air Force enlisted personnel. The subjects included aircraft mechanics, firemen, fuel specialists, supply/inventory specialists, personnel specialists, law enforcement specialists and medical technicians.

After identifying a number of work obstacles common to Air Force enlisted positions, they proposed an initial taxonomy of 14 situational constraint categories and fielded a questionnaire. The data provided information about the psychometric properties of the questionnaire and was used to refine the questionnaire. In the next phase, an improved constraints questionnaire was used to investigate

empirically the relationships between constraints and performance, motivation, affective reactions, reenlistment plans and thoughts of leaving. The incumbents' supervisors participated by rating the airmen's job performance and effort.

Results indicated constraints were significantly correlated with affective reactions and thoughts of leaving, but they were not highly correlated with performance ratings or reenlistment plans. Ergo, their results indicated that constraints, appropriately measured, affect internal states but do not have a substantive impact on work behaviors.

At least three explanations may account for the lack of evidence supporting a relationship between constraints and performance. One possibility is that the O'Connor, et al. (1984) constraint measures did not capture relevant variance in constraints. If the measures were not sensitive to relevant variance in constraints, then this pattern of results might have been expected.

The second possibility is that the performance measures were deficient in some way. However, the performance instruments were based on Air Force occupational analysis results that identified key job duties. Also, the internal consistency reliability assessment indicated that the pattern of ratings were consistent, and reflected an underlying construct, based on job content.

Raters may have given lower performing airmen subjected to high constraint conditions ratings equal to those received by their peers who produced higher absolute levels of output in a less constraining environment. Peters, et al. (1984) reported only slight differences between absolute and situational ratings. This was probably due to low levels of constraints reported by the airmen in the seven AFSCs studied. More damaging were the high correlations between corresponding dimensions, across absolute and situational rating methods. If differences in constraints across career fields have an impact on absolute levels of performance, lower correlations should have been found. This would reflect the fact that while people are recognized for working through difficult circumstances, the circumstances do negatively affect the quality and quantity of work they produce. Since workers do not face the same constraints, the impact of the constraints should not be consistent, and should not result in similar rank orderings of airmen on these absolute and situational performance criteria.

The third explanation for the low relationships between constraints and performance is suggested by the very low mean levels of constraints reported. The data suggest that none of the constraints were consistently perceived to be severe, and few severely constraining work settings existed in the AFSCs investigated. Therefore, it is understandable

that the variance in constraints that did exist would not have an impact on performance or reenlistment intentions. Also, it is understandable that the performance variance was not restricted in high constraint work settings, since the absolute level of constraints present in both high and low constraint settings was low.

Results for affective reactions to constraints and more definite constraints were consistently found to relate to affective reactions across AFSCs. Even though constraints did not relate to the subjects' reenlistment plans, thoughts of leaving produced significant results, but evidence did not support the impact of constraints on reenlistment decisions. In theory, the propensity to leave results from a sequential chain of internal states starting with dissatisfaction, going through thoughts about leaving, and culminating in the intent to leave (Mobley, 1977; Mobley, et al, 1979). While it was anticipated that constraints would be related more strongly with factors closer to the beginning of the internal process, it was expected that significant findings involving intentions to reenlist would appear. Results indicated, constraints were not associated with behavior or in intentions to reenlist.

O'Connor, et al. (1984) assumed that constraints existed in the physical environment and prevented incumbents from fully utilizing their skills at work. The more severe the constraints, the more they were expected to influence

performance and affective outcomes. Results consistent with this perspective include findings that airmen experience more negative affective reactions as constraints increase, but the reactions were not severe enough to go beyond thoughts of leaving. Therefore, mild constraints did not make the airmen unsatisfied or frustrated enough to affect performance or reenlistment plans. In this regard, mild levels of constraints would reflect a nuisance factor in doing the job; an additional "cost" to be paid to accomplish tasks. The cost is experienced as frustration and dissatisfaction that may increase stress but does not degrade performance in the short term (O'Connor, et al., 1984).

Steel and Mento (1989) studied situational constraints within an Air Force civil engineering organization comprised of 165 military and 108 civil service employees. They attempted to control the bias that can result when subordinates provide both the constraint ratings and the job satisfaction and frustration criterion ratings. The degree of constraints faced by a subordinate was judged by his or her immediate supervisor. These supervisory constraint ratings were then related to subordinate self-reports of affective responses such as job satisfaction, organizational commitment, and job involvement. One significant correlation was obtained between constraints and the satisfaction measure. Contrary to prediction, but not

necessarily to research precedent (O'Connor, et al., 1984), constraints were not found to be significantly correlated with either form of performance appraisal (i.e., supervisory ratings or self-ratings).

Similar approaches toward measurement were employed by Steel and Mento (1986) on a sample of finance company officers and by Steel, et al (1987) on finance company cashiers. After comparing the results of these three studies, Steel and Mento suggested that constraints in military organizations may be more pronounced, in some cases, than constraints in the private sector. One reason for these differences may be the large amount of "red tape" governmental and military organizations are forced to work with. If the magnitudes of constraints are particularly large in military organizational environments, they would offer considerable leverage for productivity improvements (Steel and Mento, 1989).

During Phase I of the O'Connor, et al (1984) study open-ended questionnaires were sent to 956 airmen stationed at 12 randomly selected Air Force bases throughout the United States. Two hundred fifty-six were returned to the Air Force Human Resources Laboratory with usable responses. Each participant described up to two instances in which they believed a specific situational factor had negatively affected their performance. Participants also described their affective reactions to the constraint, what they did

in response to it, and their reasons for behaving the way they did. The 256 airmen provided 357 usable critical incidents.

Using a procedure described by Peters, et al (1980), O'Connor, Eulberg, and Peters independently sorted the 357 abstracts into categories based on their content similarity. Each sorter attempted to identify the key factor or event which negatively affected performance. The resulting classification system focused on specific performance-relevant situational constraints which might be mediated by any number of persons. The summaries for some of the 14 categories were further sorted into subcategories to clearly describe the critical incidents provided by the airmen. The situational constraint dimensions, their definitions, and subcategories are presented in Table 1.

These 14 constraint dimensions are similar to those reported in earlier civilian research. However, the categories "Red Tape" and "Transportation" have only been found in military research (Eulberg, et al, 1983, 1984). Additionally, "Budgetary Support", a category identified in previous civilian research (Peters, et al., 1980) was not observed in the Air Force sample.

The resulting questionnaire required respondents to express the degree to which they believed each of 57 statements accurately described their work situation. Responses were made on five-point graphic rating scales

ranging from *Not at all accurate* (1) to *Completely accurate* (5).

Steel and Mento (1986) and Steel, et al. (1987) developed a measurement scale that contained four items dealing with the degree to which task environments are perceived as more or less constraining. The four items dealt with job induced obstacles, interpersonal or social obstacles, constraints in the physical job environment, and constraints that stem from organizational policies and procedures. For their study involving 273 Air Force civil engineering personnel, Steel and Mento modified this instrument to make the examples contained in the items congruent with the military context in which the participants worked. An example of their original scale is provided in Appendix A.

As mentioned earlier, it is possible that constraint perceptions are systematically related to the personal characteristics of the subjects. Watson, Clark, and Tellegen (1988) developed the 10-item NA and PA scales that make up the Positive and Negative Affect Schedule (PANAS). Their research asked subjects to rate on a 5-point scale the extent to which they had experienced 20 different mood

TABLE 1
PHASE I SITUATIONAL CONSTRAINT DIMENSIONS,
DEFINITIONS, AND SUBCATEGORIES
(O'Connor, Eulberg, Peters, and Watson, 1984)

Individuals were unable to perform their jobs due to the following constraints:

- I. Training - inadequate training of individuals and co-workers
- II. Materials and Supplies - unavailability/wrong orders
- III. Time - not enough time or time delays
- IV. Tools and Equipment - not enough equipment, damaged equipment, or poorly designed equipment
- V. Planning/Scheduling of Activity - waiting on help from others
- VI. Cooperation from Others - poor cooperation, untimely cooperation, and cooperation hard to get
- VII. Personnel - insufficient number of people
- VIII. Physical Working Conditions - work environment
- IX. Policies and Procedures - uncertainty due to insufficient notice and inconsistent or incorrect policies and procedures
- X. Red Tape - rules and regulations
- XI. Transportation - individual could not get to job site
- XII. Job Relevant Authority - lack of needed authority
- XIII. Job Related Information - unavailable, wrong or inconsistent information
- XIV. Forms - lack of proper forms

states during a specified timeframe. The scale ranged from *Very Slight or Not at All* (1) to *Very Much* (5).

Item Intercorrelations and internal consistency reliabilities (Conbach's coefficient alpha) were all acceptably high, ranging from .86 to .90 for PA and from .84 to .87 for NA. Also, the correlation between NA and PA scales was invariably low, ranging from -.12 to -.23. Therefore, the scales are largely independent of each other, an attractive feature for many purposes. The scales stability coefficients were high enough to suggest that they may be used as trait measures of affect. Furthermore, factorial and external evidence of convergent and discriminant validity indicate the scales provide reliable, precise, and largely independent measures of Positive Affect and Negative Affect, regardless of the subject population studied or the timeframe and response format used.

Previous research in military settings has not been able to show a strong relationship between situational constraints and job performance. The instruments used in these studies only asked the participants for judgments about accuracy of constraint descriptions. The respondents were never asked how much the constraints affected their task accomplishment. As a result, the effects of situational factors are unknown. Therefore, situational factors that may affect job performance have not been

investigated systematically. The goal of this research is to answer the three following investigative questions.

Question 1. Do severe situation constraints exist in the aerial port environment?

Question 2. Why have situational factor/performance relationships not been stronger in previous studies?

Question 3. How do individual personality traits affect individual perceptions of constraints in the work place?

III. Method

The methods used to solve the research problem are discussed in the chapter.

Sample and Setting

Subjects were military personnel assigned to a large US Air Force aerial port squadron located in the Western U.S. The aerial port squadron was responsible for supporting passengers, moving cargo, servicing aircraft, and shipping and receiving personal property. Participation was voluntary. A total of 143 available airmen between the rank of E-1 through E-6 completed a Work Environment Survey (for a response rate of 64 percent). The typical respondent was male (82 percent), between 20 and 25 years old, who had been assigned to the work section for more than 5 months. The mean age for the 26 women in the sample was also between 20 and 25 years of age, and they had also been affiliated with the work section for more than 5 months.

Instruments

Situational Constraints. Three separate measures of situational constraints were employed in this investigation.

Two of these measures were used in previous studies and the third was designed specifically for this study. The measures can be found in Appendix C.

The first scale was developed by O'Connor, et al (1984). It contained 57 items written to assess the 14 constraint dimensions listed in Table 1. The questionnaire required participants to express the degree to which they believed each of the 57 statements accurately described their own work situation. Responses were made on a 5-point graphic rating scale, ranging from *Not at All Accurate* to *Completely Accurate*. A sixth option, *Does Not Apply to My Job* was also included.

The second scale was drawn from previous studies by Steel and Mento (1986) and Steel, et al. (1987). This instrument was modified slightly to make the examples contained in the items congruent with the military context in which participants worked. The scale contained four items dealing with the degree to which task environments are perceived as more or less constraining. The four items in the measure dealt with job-induced obstacles, interpersonal or social obstacles, constraints in the physical job

environment, and constraints that stem from organizational policies and procedures.

The third measurement scale was developed specifically for this study. It is a modification of the 57-item questionnaire developed by O'Connor, et al (1984). It asks respondents to indicate how often situational factors helped or hindered their work performance. Responses were made on 5-point graphic rating scales ranging from *Almost never* (1) to *Very often* (5). Some items were rewritten slightly to make them more compatible with the present survey's format.

Affective Measures. Participants' temperament was measured with a 20-item instrument (PANAS) developed by Watson, et al. (1988). The items in this instrument were scaled on 5-point rating scales ranging from *Very Slightly or Not At All* (1) to *Extremely* (5). The respondents were asked how often they had experienced different feelings and emotions in the past year.

Performance Ratings. At least one, and in most cases two immediate supervisors for each participant provided a supervisory appraisal over three specific performance dimensions: task, interpersonal, and motivational elements.

The appraisal consisted of 15 questions and asked the supervisors to rate each subordinate on their job performance, willingness to help and cooperate with others, and their potential for selection for professional military education, career advancement, and early promotion. Participants were rated on 5-point rating scales ranging from *Much Below Average* (1) to *Much Above Average* (5). A sample of this survey is provided in Appendix D.

Demographic Data. The Work Environment Factors Survey and the Supervisor Performance Form each contained eight questions that gathered data on the biographical backgrounds of the participants. The questions and response options were the same for both surveys. A sample of the background information questions is provided in Appendix E.

Analysis Method

Mean values for each constraint variable were calculated to identify which constraints were perceived to have a significant impact on the respondents. The response scale: *Almost never* (1) to *Very often* (5) was used for this scale. Responses for the O'Connor, et al. (1984) scale

ranged between *Not at all accurate* (1) to *Completely accurate* (5).

Internal Consistency. The extent to which the pattern of responses to questions about individual constraints correlated with others within the same category was consistent with what was assessed by the internal consistency reliability coefficient (Cronbach's alpha). A coefficient alpha that is greater than .70 indicates a pattern of responses consistent enough to be useful in research (Nunnally, 1978).

Coefficient of Determination. The multiple correlation coefficient (R), represents the strength of the relationship between a criterion variable and an optimally weighted linear combination of predictor variables. Its values range from .00 through 1.00. Values near zero indicate little relationship between the criterion and the predictors, values near 1.00 indicate strong relationships. The amount of variance in one variable that is accounted for by another variable can be estimated by squaring the correlation between the two variables. The product (R^2) is referred to as the coefficient of determination. The R^2 value

represents the percentage of variance in one variable that is accounted for by the linear combination of predictor variables.

When several independent variables are used to predict the criterion, intercorrelations among the variables may confound interpretation. Hierarchical regression procedures described by Cohen and Cohen (1983) were used to estimate the changes in R^2 (ΔR^2) accounted for by adding a new independent variable to a prediction model. Differences in R^2 obtained by adding and then removing variables from a regression model, reflect the amount of variance uniquely explained by each variable in the model. This procedure was used to test the relationships between alternate influences on constraints, accuracy, perceptions of favorable or unfavorable situational factors, experience, skill, and personality predictors.

IV. Data Description and Analysis

Perception of Constraints

Means and item numbers for the constraint dimension scores are presented in Table 2. The accuracy scores represent the scale developed by Peters, Eulberg, et al. (1984). The positive and negative items are from the scale developed for this study. Means for the 14 constraint dimensions on the Accuracy scale ranged from 2.32 to 3.18. Only one of these means exceeded the midpoint on the scale (3.0). The means for the 14 constraint dimensions in Table 2 indicate that the 14 constraint dimensions were perceived as having little impact on job performance

Internal Consistency of Constraint Dimensions

Cronbach's alpha was computed to index the internal consistency of each of the 14 constraints. The alphas for each constraint are presented in Table 3. Alphas were lower than desirable for some of the scales. Reliabilities were adequate overall for the Accuracy measure scale, although Time and Planning/Scheduling of Activity were below the

TABLE 2
DESCRIPTIVE MEANS OF PERCEIVED CONSTRAINTS

Constraint Scales/ Item Numbers ¹	(1) Accuracy	(2) Positive Factors	(3) Negative Factors
Training 2, 14, 29, 40	2.52	3.33	3.02
Materials and Supplies 3, 16, 31, 51	2.52	3.11	2.99
Time 6, 19, 32, 41	2.61	2.85	3.02
Tools and Equipment 1, 13, 27, 37, 44, 50	2.55	3.10	2.87
Planning/Scheduling of Activity 5, 17, 53	2.57	2.76	3.23
Cooperation from Others 7, 18, 38, 45, 54, 56	2.61	3.27	3.05
Personnel 8, 20, 28	3.18	3.07	3.30
Physical Working Conditions 9, 21, 42	2.64	2.73	2.58
Policies and Procedures 11, 22, 33, 39, 47, 55	2.59	2.92	3.10
Red Tape 10, 23, 34	2.65	2.76	2.81
Transportation 12, 25, 43	2.41	2.94	2.81
Job Relevant Authority 26, 36, 49	2.67	3.07	3.06
Job Related Information 4, 15, 30, 46, 52, 57	2.59	3.12	3.10
Forms 24, 35, 48	2.32	3.12	2.91

Note: Item numbers refer to Work Environment Factors Survey in Appendix C. N = 115-129.

minimum score of .70. Only six of the constraints could be considered reliable on the Positive Factors scale.

Training, Materials and Supplies, Time, Tools and Equipment, Planning/Scheduling of Activity, Transportation, and Job Relevant Authority all fell short of the .70 standard. Six constraints on the Negative Factors scale also did not meet the minimum level of reliability.

Those constraints were Training, Time, Planning/Scheduling of Activity, Personnel, Red Tape, and Job Relevant Authority. Two constraint dimensions, Time and Planning/Scheduling of Activity, did not meet the standard in any of the scales. Cooperation from Others, Physical Working Conditions, Policies and Procedures, Job Related Information, and Forms related significantly across all three scales. In total, 6 of the 14 factors on the Positive Factors scale and 8 on the Negative Factors scale were adequately reliable. The patterns of responses for these constraints were consistent enough to be used in this research. Constraints with reliabilities less than .70 were eliminated from the study.

TABLE 3
CRONBACH'S ALPHA FOR EACH
CONSTRAINT DIMENSION

<u>Cronbach's Alpha</u>				
<u>Constraint</u>	<u># Items</u>	<u>Accuracy</u>	<u>Positive Factors</u>	<u>Negative Factors</u>
Training	4	.72	.56	.54
Materials and Supplies	4	.78	.60	.72
Time	4	.69	.63	.55
Tool and Equipment	6	.89	.66	.76
Planning/Scheduling of Activity	3	.65	.57	.59
Cooperation from Others	6	.91	.74	.80
Personnel	3	.81	.72	.69
Physical Working Conditions	3	.88	.81	.71
Policies and Procedures	6	.91	.73	.76
Red Tape	3	.90	.72	.65
Transportation	3	.87	.67	.71
Job Relevant Authority	3	.80	.49	.67
Job Related Information	6	.85	.80	.78
Forms	3	.83	.67	.72

Constraint perceptions were also mild across all four dimensions of Steel and Mento's (1986) scale. Means ranged from 2.78 for Environmental Obstacles to 3.09 for Job Induced Constraints.

Intercorrelations of Study Variables

All of the possible constraint dimensions presented in the Work Environment Factors survey were investigated to determine their impact on overall performance. Of the 46 possible associations with the three constraint scales, only one significant relationship was observed. This correlation was observed on the positive affect scale and indicates a negative correlation. In other words, the response indicated how much the constraint helped the work effort and the negative correlation indicates that more helpful factors were associated with lower performance. This does not support the hypothesis that if constraints exist high (positive) constraints would result in higher performance. Table 4 contains constraint-performance correlations from the scales measuring the 14 constraints identified by O'Connor, et al, and the 4 dimensions identified by Steel and Mento.

The data suggests that constraints are not especially strong factors in the physical environment. One explanation might be that constraint perception is the result of the

TABLE 4
INTERCORRELATIONS BETWEEN
CONSTRAINTS AND OVERALL PERFORMANCE

O'Connor, et al, Dimensions	OVERALL PERFORMANCE		
	Positive	Negative	Original
Training	.01	-.02	-.04
Materials and Supplies	.02	-.02	-.03
Time	-.12	-.07	-.08
Tools and Equipment	-.07	.09	-.09
Planning/Scheduling of Activity	-.17	.16	-.10
Cooperation from Others	.01	.00	-.07
Personnel	-.07	-.08	-.02
Physical Working Conditions	-.13	-.01	-.09
Policies and Procedures	-.04	.02	-.04
Red Tape	-.01	-.03	-.03
Transportation	-.04	-.18	-.02
Job Relevant Authority	-.21*	.03	-.04
Job Related Information	-.01	.08	-.06
Forms	-.06	-.13	-.08
<u>Steel & Mento Dimensions</u>			
Administration or Policy Constraints	-	-	-.01
Job Induced Constraints	-	-	-.14
Interpersonal or Social Obstacles	-	-	.07
Environmental Obstacles	-	-	-.11
Total Steel Constraints	-	-	-.06

TABLE 5
INTERCORRELATIONS OF STUDY VARIABLES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1 OVERALL	(.83)										
2 CONTEXT	.88**	(.90)									
3 TASK	.88**	.92**	(.84)								
4 EXP	.03	.11*	.12*	(1.0)							
5 SKL	.18*	.21*	.22*	.76**	(1.0)						
6 SMS	-.06	-.11	-.10	-.02	-.01	(.74)					
7 Pos Sit	-.00	-.02	-.03	.15*	.12*	-.22	(.83)				
Factors											
8 Neg Sit	-.01	-.05	-.01	.08	.18*	.62**	-.15	(.96)			
Factors											
9 Accuracy	-.07	-.13	-.11	-.05	-.02	.64**	-.20	.56**	(.98)		
10 Pos	.00	-.10	-.01	.13*	.15*	-.08	.40**	-.15	-.21	(.90)	
Affect											
11 Neg	-.03	-.10	-.10	.07	.13*	.42	-.04	.44**	.54**	-.02	(.83)
Affect											

Note: N's range from 112 to 168. *p < .05, **p < .01 (one-tailed).
Coefficient alphas are on the diagonal. SMS = Steel, Mento Scale Total.

interaction between the environment and individual's personality traits. Table 5 reports correlations between constraints, affective responses, and performance. Contextual (CONTEXT) and task (TASK) performance are significantly and highly correlated with overall performance (OVERALL). This implies that contextual and task performance lead to strong overall performance. Skill shows a weak but significant correlation to both contextual and task performance and a strong and significant correlation to experience. However, skill is weakly associated with overall performance. Four strong correlations appear in the Steel, Mento Scale Total (SMS). A strong negative correlation is associated with Positive Factors while a strong positive correlation is associated with Negative Factors and the Accuracy scale. This is expected as both scales were designed to measure negative constraints. Negative Affectivity (Neg Affect) was also strongly correlated with SMS, Negative Factors, and Accuracy. This pattern of correlations suggests individuals high in Negative Affectivity are more apt to notice and report constraints that hinder job accomplishment than people less

associated with Negative Affectivity. Analysis also found a strong association between Negative Affectivity and the Accuracy scale. Since the scale was designed to measure negative constraints this was expected. Positive Affectivity (Pos Affect) is negatively correlated with SMS, Negative Factors, and Accuracy. Positive Affectivity is strongly associated with Positive Factors as would be expected. Thus, individuals high on Positive Affectivity were more likely to view situational factors as more helpful to job performance than those individuals high on Negative Affectivity.

Hierarchical Regression

Even though constraints were perceived as mild in this aerial port environment, if these constraints had a "real" impact on performance we would expect technicians with less experience and skill to report more constraints since they would be more dependent on resources and help from others. If the constraints are mostly due to perceptions of obstacles in the work environment we would expect individual's experience and skill not to have as much an impact on performance as their personality or temperament.

Furthermore, individuals with a more negative outlook could be expected to report higher levels of constraints than those with a more positive outlook. These hypotheses were tested by hierarchical regression. The analysis was conducted using two separate scales. Results for these analyses are presented in Table 6. First, the scale developed by Steel and Mento was tested. Negative Affectivity accounted for significant proportion of the variance in 4 of 5 constraint dimensions over and above the variance accounted for by skill and experience. It was not significant in the Job Induced Constraints dimension. For the others, additional variance explained by Negative Affect above and beyond experience and skill ranged from $\Delta R^2 = .13$ to $\Delta R^2 = .20$ ($p < .001$). While the additional variance explained by Negative Affect in Job Induced Constraints ranged from .03 to .07 ($p < .05$).

TABLE 6
RESULTS OF HIERARCHICAL REGRESSION ON
PERFORMANCE CONSTRAINTS AND OBSTACLES SCALE

<u>DEPENDENT VARIABLE</u>	<u>MODEL</u>	<u>INDEPENDENT VARIABLE</u>	<u>R²</u>	<u>ΔR²</u>	<u>SIGNIFICANCE</u>
Administration or Policy Constraints	1	EXP, SKL	.00	-	.82
	2	EXP, SKL, NEGAF	.19	.19	.00
Job Induced Constraints	1	EXP, SKL	.03	-	.21
	2	EXP, SKL, NEGAF	.05	.02	.07
Interpersonal or Social Obstacles	1	EXP, SKL	.01	-	.65
	2	EXP, SKL, NEGAF	.17	.16	.00
Environmental Obstacles	1	EXP, SKL	.01	-	.74
	2	EXP, SKL, NEGAF	.13	.12	.00
Total Constraints/ Obstacles	1	EXP, SKL	.00	-	.98
	2	EXP, SKL, NEGAF	.20	.20	.00

Note: N = 120. All tests are one tailed

EXP = Experience, SKL = Skill, NEGAF = Negative Affect

To further test this hypothesis, the same analyses was conducted on the negative factors scale developed for this study. The results of these analyses are presented in Table 7. In Training, Time, Personnel, Physical Working Conditions, and Red Tape, experience and skill accounted for a significant amount of variance. However, in each of the other eight dimensions, Negative Affect explained a significant proportion of variance over and above the variance accounted for by experience and skill.

An analysis was repeated using the positive affect scale of the 14 constraint dimensions developed to see if Positive Affectivity would account for a significant proportion of the variance over and above the effects of experience and skill. Training was the only dimension where experience and skill accounted for significant variance, $\Delta R^2 = .03$ ($p < .05$). In each of the 14 dimensions Positive Affect accounted for significant proportions of the variance over the variance accounted for by experience and skill. The results of these analyses are presented in Table 8.

To further test the effects of Negative Affectivity on performance a third analysis was conducted using the original 14 constraints scale developed by Peters, Eulberg, et al. For this analysis, experience, skill, and positive affect were entered as a set and negative affect was regressed separately on the 14 constraint dimensions to determine the variance accounted for by Negative Affectivity over and above the variance accounted for by experience, skill and Positive Affectivity. Training and job related information were the only dimensions for which experience, skill, and Positive Affectivity had a significant

relativity. For each of the constraints negative affect accounted for a significant amount of variance ($\Delta R^2 = .08 - .28$) over and above experience, skill, and Positive Affectivity. The results of these analyses are in Table 9. The results of these analyses show that both Negative and Positive Affectivity were more strongly related constraint perceptions than experience or skill levels.

TABLE 7
RESULTS OF HIERARCHICAL REGRESSION TESTS
FOR NEGATIVE SITUATIONAL FACTORS

<u>DEP VARIANCE</u>	<u>MODEL</u>	<u>INDEP VARIANCE</u>	<u>R²</u>	<u>ΔR²</u>	<u>SIGNIFICANCE</u>
Training	1	EXP, SKL	.06	-	.03
	2	EXP, SKL, NEGAF	.14	.08	.00
Materials and Supplies	1	EXP, SKL	.01	-	.48
	2	EXP, SKL, NEGAF	.14	.13	.00
Time	1	EXP, SKL	.06	-	.03
	2	EXP, SKL, NEGAF	.13	.07	.00
Tools and Equipment	1	EXP, SKL	.03	-	.22
	2	EXP, SKL, NEGAF	.16	.13	.00
Planning/ Scheduling of Activity	1	EXP, SKL	.04	-	.07
	2	EXP, SKL, NEGAF	.18	.14	.00
Cooperation from Others	1	EXP, SKL	.03	-	.16
	2	EXP, SKL, NEGAF	.18	.15	.00
Personnel	1	EXP, SKL	.06	-	.02
	2	EXP, SKL, NEGAF	.10	.04	.01
Physical Working Conditions	1	EXP, SKL	.05	-	.04
	2	EXP, SKL, NEGAF	.12	.07	.00
Policies and Procedures	1	EXP, SKL	.04	-	.08
	2	EXP, SKL, NEGAF	.15	.11	.00
Red Tape	1	EXP, SKL	.08	-	.01
	2	EXP, SKL, NEGAF	.18	.08	.00
Transportation	1	EXP, SKL	.02	-	.41
	2	EXP, SKL, NEGAF	.05	.03	.06
Job Relevant Authority	1	EXP, SKL	.00	-	.90
	2	EXP, SKL, NEGAF	.15	.15	.00
Job Related Information	1	EXP, SKL	.05	-	.06
	2	EXP, SKL, NEGAF	.14	.09	.00
Forms	1	EXP, SKL	.00	-	.95
	2	EXP, SKL, NEGAF	.09	.09	.00

Note: N = 119-124. EXP = experience, SKL = skill,
NEGAF = negative affectivity

TABLE 8
RESULTS OF HIERARCHICAL REGRESSION TESTS
FOR POSITIVE SITUATIONAL FACTORS

DEP VARIABLE	MODEL	INDEP VARIABLE	R ²	Δ R ²	SIGNIFICANCE
Cooperation from Others	1	EXP, SKL	.00	-	.84
	2	EXP, SKL, POSAF	.11	.11	.00
Personnel	1	EXP, SKL	.06	-	.02
	2	EXP, SKL, POSAF	.15	.09	.00
Physical Working Conditions	1	EXP, SKL	.03	-	.20
	2	EXP, SKL, POSAF	.06	.03	.03
Policies and Procedures	1	EXP, SKL	.03	-	.15
	2	EXP, SKL, POSAF	.10	.07	.00
Red Tape	1	EXP, SKL	.10	-	.73
	2	EXP, SKL, POSAF	.01	.03	.04
Job Related Information	1	EXP, SKL	.02	-	.31
	2	EXP, SKL, POSAF	.14	.12	.00

Note: N = 114-124. EXP = experience, SKL = skill,
POSAF = positive affect

TABLE 9
RESULTS OF HIERARCHICAL REGRESSION ON
ACCURACY DIMENSIONS

<u>DEP VARIANCE</u>	<u>MODEL</u>	<u>INDEP VARIANCE</u>	<u>R²</u>	<u>ΔR²</u>	<u>SIGNIFICANCE</u>
Training	1	EXP, SKL, POSAF	.08	-	.03
	2	EXP, SKL, POS/NEGAF	.36	.28	.00
Materials and Supplies	1	EXP, SKL, POSAF	.04	-	.17
	2	EXP, SKL, POS/NEGAF	.26	.22	.00
Cooperation from Others	1	EXP, SKL, POSAF	.06	-	.08
	2	EXP, SKL, POS/NEGAF	.32	.26	.00
Personnel	1	EXP, SKL, POSAF	.06	-	.06
	2	EXP, SKL, POS/NEGAF	.29	.23	.00
Physical Working Conditions	1	EXP, SKL, POSAF	.02	-	.98
	2	EXP, SKL, POS/NEGAF	.13	.12	.00
Policies and Procedures	1	EXP, SKL, POSAF	.05	-	.11
	2	EXP, SKL, POS/NEGAF	.21	.16	.00
Red Tape	1	EXP, SKL, POSAF	.05	-	.10
	2	EXP, SKL, POS/NEGAF	.18	.13	.00
Transportation	1	EXP, SKL, POSAF	.05	-	.12
	2	EXP, SKL, POS/NEGAF	.13	.08	.00
Job Relevant Authority	1	EXP, SKL, POSAF	.04	-	.16
	2	EXP, SKL, POS/NEGAF	.25	.21	.00
Job Related Information	1	EXP, SKL, POSAF	.03	-	.28
	2	EXP, SKL, POS/NEGAF	.26	.23	.00
Forms	1	EXP, SKL, POSAF	.02	-	.44
	2	EXP, SKL, POS/NEGAF	.20	.18	.00

Note: N = 119-120. EXP = experience, SKL = skill,
NEGAF = negative affectivity, POSAF = positive affectivity

V. Findings and Conclusions

Results showed constraints had little if any effect on airmen's performance ratings in the aerial port studied. Skill level and experience were significantly correlated with performance. Several possible explanations exist. First, workers may have developed ways to keep constraints from affecting their performance ratings. Another explanation, also suggested by O'Connor, et al (1984), may be that Air Force emphasis on readiness for military conflict may have led to the existence of sufficient "slack" in the peacetime work environment to preclude these problems. Bourgeois (1981) defines slack as "that cushion of actual or potential resources which allow an organization to adapt successfully to internal pressures for adjustment or to external pressures for change in policy, as well as to initiate changes in strategy with respect to the external environment." Since constraints involve the amount of resources available, you would expect to find low levels of constraints where high levels of slack have been built into an organization. If this is the case, individuals would realize that their performance would not be adversely

affected by the level of available resources and, therefore, would not consider the available resources to be constraints to performance.

Negative affect had a more direct impact on performance than experience, skill, and positive affects. Individuals high on negative affectivity were more likely to identify constraints in their work environment than others.

The low to moderate constraints reported in this environment may be good indicators of the effectiveness of the aerial port's management. It would appear managers are doing a good job of preventing situational constraints from negatively impacting the performance of their technicians.

It would be interesting to see if the overseas enroute stations experience the same low to moderate constraints reported at this CONUS port. I recommend a follow-up study at this same port to measure the effects of the drawdown and manpower reductions over the next year. Also, the squadron had initiated a new comprehensive training program for all inbound airmen. The program requires each individual to be trained in all aspects of the aerial port before being assigned a permanent job. The training program takes the

average airman 18 months to complete. Also, the squadron is scheduled to upgrade its cargo tracking procedures.

Antiquated manual systems will soon be replaced by "state of the art" automated systems. Finally, the squadron is scheduled to undergo a change of command in the near future.

It would be interesting to see how these changes affect the perception of situational constraints in the environment.

Appendix A: Performance Obstacles and Constraints

Instructions: Circle the number beside each performance constraint to indicate how frequently it poses a problem for this employee.

- | | Very | | | | | Very | |
|--|-------|--------|--------|-----------|-------|-------|--------|
| | Never | Rarely | Rarely | Sometimes | Often | Often | Always |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
-
1. Job Induced Constraints 1 2 3 4 5 6 7
Def: Factors in the make-up of the job itself (e.g., assembly line paced work) that determine levels of performance.

 2. Interpersonal or Social Obstacles 1 2 3 4 5 6 7
Def: Represents the quality of interpersonal relationships (e.g., communication climate, cooperation) among individuals who interact with the employee in the course of his/her work.

 3. Environmental Obstacles 1 2 3 4 5 6 7
Def: Factors in the physical environment (e.g., excessive noise or heat) and in the geographical locale of the work (e.g., sales potential) that effect job performance.

 4. Administrative or Policy Constraints 1 2 3 4 5 6 7
Def: Rules, regulations, and requirements imposed upon an individual by the organization or governmental agencies that impede the employee's job performance to a greater extent than employees doing comparable work.

Appendix B: PANAS Scale

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent (INSERT THE APPROPRIATE TIME INSTRUCTIONS HERE). Use the following scale to record your answers

Very			Extremely		
Slightly A Little Moderately Quite a Bit or not a all					
1	2	3	4	5	
	_____	interested	_____		irritable
	_____	distressed	_____		alert
	_____	excited	_____		ashamed
	_____	upset	_____		inspired
	_____	strong	_____		nervous
	_____	guilty	_____		determined
	_____	scared	_____		attentive
	_____	hostile	_____		jittery
	_____	enthusiastic	_____		active
	_____	proud	_____		afraid

Moment (you feel this way right now, that is, at the present moment)

Today (you have felt this way today)

Past few days (you have felt this way during the past few days)

Week (you have felt this way during the past week)

Past few weeks (you have felt this way during the past few weeks)

Year (you have felt this way during the past year)

General (you generally feel this way, that is, how you feel on the average)

Appendix C: Workers' Survey

Describing Your Job

Listed below are a number of items which may or may not describe your present *job situation* in the Air Force. We are interested in the extent to which each of these statements describes your particular job situation. In this section we want to know about your job and not about your attitudes toward that job or the tasks you perform. Thus, as you complete this questionnaire, think about the job environment you work in, not how you feel about it or what you do in it.

Using the scale below, rate how accurately each statement describes your present job situation in the Air Force. In the space to the right of each statement, write the number which represents your rating. If any statement does not apply to your particular job, write the number "6" in the blank space to indicate that it does not apply. As you read through the list, you will note that some of the statements are similar. However, no two of them are exactly alike or have exactly the same meaning. You should simply respond to them as they come and not feel any special need to check back to make answers agree. Please be sure to respond to all of the items.

1	2	3	4	5	6
Not at all Accurate	Somewhat Accurate	Fairly Accurate	Very Accurate	Completely Accurate	Does Not Apply to My Job
123.	The Air Force frequently does not provide me with the necessary tools and/or equipment when needed.				me get my job done.
	_____				_____
124.	I often must work with and depend upon others who are not well trained.				130. My job is typically harder to do because I have to make up for a shortage of capable personnel in my unit.
	_____				_____
125.	I frequently cannot get necessary materials, supplies, and/or parts when I need them.				131. I am often hampered in doing my job by bad weather conditions (too hot, etc.).
	_____				_____
126.	The information I must have in order to do my job is often not available.				132. It often takes me too long to do my job because I have to deal with "red tape."
	_____				_____
127.	I am frequently given unscheduled activities to work on which keep me from getting my job done.				133. I often cannot get my job done because policies, procedures, and instructions are changed without enough advance notice.
	_____				_____
128.	I never have enough time to finish my duties without rushing.				134. I cannot get the transportation I need to do my job when I need it.
	_____				_____
129.	The cooperation I am supposed to get from others frequently does not help				135. I frequently do not have enough of the right tools and/or equipment to do my job.
	_____				_____

- | | |
|--|--|
| 136. The Air Force has not provided me with enough training to do my job.
_____ | the transportation I need to do my job.
_____ |
| 137. The information I need to do my job is frequently wrong when I receive it.
_____ | 148. I often have to follow the instructions of others even though I am in a better position to know what should be done.
_____ |
| 138. The Air Force does not provide me with the necessary materials, supplies, and/or parts when I need them.
_____ | 149. I frequently must work with faulty or damaged tools and/or equipment.
_____ |
| 139. My work doesn't get done because my schedule often gets changed without enough advance notice.
_____ | 150. The lack of qualified people in my unit typically makes it difficult for me to get my job done.
_____ |
| 140. The cooperation I am supposed to receive frequently does not come when I need it.
_____ | 151. I am not usually given enough training to handle new duties which are added to my job.
_____ |
| 141. I typically am not given the time I need to do my job.
_____ | 152. I frequently get job information from others which is inconsistent.
_____ |
| 142. I often find that I have too much work to do in order to make up for a lack of qualified personnel in my unit.
_____ | 153. I am frequently provided with the wrong materials, supplies, and/or parts.
_____ |
| 143. My job is frequently made more difficult by bad weather conditions (too hot, too cold, too wet, etc.).
_____ | 154. Long time delays keep me from getting my job done.
_____ |
| 144. My job is often made harder because I am not given enough advance notice about major changes in policies, procedures, and/or instructions.
_____ | 155. I frequently receive inconsistent policies, procedures, and instructions which make it difficult to do my job.
_____ |
| 145. I often cannot finish my job on time because of "red tape."
_____ | 156. Too much "red tape" frequently keeps me from getting my job done on time.
_____ |
| 146. The required forms I need to complete to get my job done are often not available.
_____ | 157. I often cannot obtain the forms I need to get my job done.
_____ |
| 147. I often have to wait for a long time to get | 158. Continually having to get the approval of others often keeps me from getting my job done.
_____ |

- | | |
|---|---|
| 159. The Air Force often provides me with tools and/or equipment which are poorly designed for getting my job done.
_____ | it difficult for me to get my job done.
_____ |
| 160. It is hard for me to get the help from others that I need to do my job.
_____ | 170. The proper forms I need to do my job are often not available.
_____ |
| 161. My job is often made harder because I must follow specific policies, procedures, and instructions which I know to be wrong.
_____ | 171. I am often not able to do my job well because I am not allowed to make those job decisions I can make best.
_____ |
| 162. I must work with and depend upon others who are poorly trained to do their jobs.
_____ | 172. The equipment I am given is poorly designed for getting my job done.
_____ |
| 163. I frequently have to wait on others to do their jobs before I can finish my own work.
_____ | 173. The replacement materials, supplies, and/or parts I receive are often the wrong ones.
_____ |
| 164. Bad weather conditions (too hot, too cold, too wet, etc.) make doing my job more difficult.
_____ | 174. I often do not have the information I must have at work when it is needed.
_____ |
| 165. There are frequent delays in getting the transportation I need in order to do my job.
_____ | 175. I often cannot get my work done because I am not told of schedule changes far enough ahead of time.
_____ |
| 166. The tools and/or equipment I must work with are often broken.
_____ | 176. I often have to wait too long to get the help I need to do my job.
_____ |
| 167. The cooperation I receive from others is often so poor that it doesn't help me get my job done.
_____ | 177. The incorrect policies, procedures, and instructions I often receive make it difficult for me to get my job done.
_____ |
| 168. The information I need to do my job is often incorrect when I receive it.
_____ | 178. I frequently have trouble getting cooperation from others who are supposed to help me do my job.
_____ |
| 169. The inconsistent policies, procedures, and instructions I often receive make | 179. The information I get from others which I need to do my job is often inconsistent.
_____ |

Performance Obstacles and Constraints

Instructions: The next four items represent obstacles and constraints that you may encounter in your work which inhibit good performance. Select the number beside each performance constraint to indicate how frequently it poses a problem for you.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

180. Job Induced Constraints

Def: Factors in the make-up of the job itself (e.g., rely on other sections) that determine levels of performance.

181. Interpersonal or Social Obstacles

Def: Represents the quality of interpersonal relationships (e.g., communication climate, cooperation) among individuals who interact with you in the course of your work.

182. Environmental Obstacles

Def: Factors in the physical job environment (e.g., excessive noise or heat) and in the geographical locale of the work that affect job performance.

183. Administrative or Policy Constraints

Def: Rules, regulations, and requirements imposed upon an individual by your organization or the Air Force that impede your job performance to a greater extent than other workers doing comparable work in a different organization.

This scale consists of a number of words that describe the different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past year. Use the following scale to record your answers.

	1	2	3	4	5
	Very Slightly or Not at All	A Little	Moderately	Quite a Bit	Extremely
184.	Interested				
185.	Distressed				
186.	Excited				
187.	Upset				
188.	Strong				
189.	Guilty				
190.	Scared				
191.	Hostile				
192.	Enthusiastic				
193.	Proud				
194.	Irritable				
195.	Alert				
196.	Ashamed				
197.	Inspired				
198.	Nervous				
199.	Determined				
200.	Attentive				
201.	Jittery				
202.	Active				
203.	Afraid				

Appendix D: Supervisors' Survey

Thank you for agreeing to participate in this research project. Your participation in this survey is strictly VOLUNTARY. Your work experience can make an important contribution to the goals of this research project.

Description of the study: The goal of this study is to learn how different types of performance contribute to overall effectiveness at work.

How your responses will be used: The information you provide will help to explain how various things people do at work make them effective or ineffective at their jobs. In the long run, it may help the Air Force do a better job of matching new recruits' skills and interests with their career fields by considering personality factors. This research will not affect anyone presently on active duty in any way.

Confidentiality of your responses: This information is being collected for research purposes only. No one in your unit, base, or MAJCOM will EVER be allowed to see your responses. You are welcome to discuss this questionnaire with anyone you choose, but please do not discuss the performance ratings you assign with anyone. This information should be considered confidential.

Read the statement below and select the number that best describes the performance of each person listed below.

While performing his or her job, how likely is it that this person would persist in overcoming obstacles to complete the task?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

Write the number in COLUMN 1 for EACH PERSON LISTED BELOW!

Read the statement below and select the number that best describes the performance of each person listed below.

While performing his or her job, how likely is it that this person would cooperate with others effectively?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

Write the number in COLUMN 2 for EACH PERSON LISTED BELOW!

Read the statement below and select the number that best describes the performance of each person listed below.

While performing his or her job, how likely is it that this person would operate equipment effectively?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

Write the number in COLUMN 3 for EACH PERSON LISTED BELOW!

Read the statement below and select the number that best describes the performance of each person listed below.

While performing his or her job, how likely is it that this person would pay close attention to important details?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

Write the number in COLUMN 4 for EACH PERSON LISTED BELOW!

Read the statement below and select the number that best describes the performance of each person listed below.

While performing his or her job, how likely is it that this person would offer to help others with their work?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

Write the number in COLUMN 5 for EACH PERSON LISTED BELOW!

Read the statement below and select the number that best describes the performance of each person listed below.

While performing his or her job, how likely is it that this person would perform job tasks effectively?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

Write the number in COLUMN 6 for EACH PERSON LISTED BELOW!

Read the statement below and select the number that best describes the performance of each person listed below.

While performing his or her job, how likely is it that this person would take the initiative to solve a work problem?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

Write the number in COLUMN 7 for EACH PERSON LISTED BELOW!

Read the statement below and select the number that best describes the performance of each person listed below.

While performing his or her job, how likely is it that this person would support a co-worker with a problem?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

Write the number in COLUMN 8 for EACH PERSON LISTED BELOW!

Read the statement below and select the number that best describes the performance of each person listed below.

While performing his or her job, how likely is it that this person would demonstrate expertise on the job?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

For EACH PERSON LISTED BELOW, write the number in COLUMN 9

Read the statement below and select the number that best describes the performance of each person listed below.

Compared with unit performance standards this person performs _____

- 1 - Much Below Average
- 2 - Below Average
- 3 - Average
- 4 - Above Average
- 5 - Much Above Average

For EACH PERSON LISTED BELOW, write the number in COLUMN 10

Read the statement below and select the number that best describes the performance of each person listed below.

Compared with others of the same rank, how well does this person perform his or her job?

- 1 - Much Below Average
- 2 - Below Average
- 3 - Average
- 4 - Above Average
- 5 - Much Above Average

For EACH PERSON LISTED BELOW, write the number in COLUMN 11

Read the statement below and select the number that best describes the performance of each person listed below.

Compared with other members of the unit, how much does this person contribute to unit effectiveness?

- 1 - Much Below Average
 - 2 - Below Average
 - 3 - Average
 - 4 - Above Average
 - 5 - Much Above Average
-

For EACH PERSON LISTED BELOW, write the number in COLUMN 12

Read the statement below and select the number that best describes the performance of each person listed below.

If the opportunity arose, how likely is it that you would choose this person for a professional military education course?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

For EACH PERSON LISTED BELOW, write the number in COLUMN 13

Read the statement below and select the number that best describes the performance of each person listed below.

If the opportunity arose, how likely is it that you would help this person move to a job that would help his or her career?

- 1 - Not At All Likely
 - 2 - Slightly Likely
 - 3 - Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

For EACH PERSON LISTED BELOW, write the number in COLUMN 14

Read the statement below and select the number that best describes the performance of each person listed below.

If the opportunity arose, how likely is it that you would recommend this person for early promotion?

- 1 - Not At All Likely
 - 2 Slightly Likely
 - 3 Moderately Likely
 - 4 - Very Likely
 - 5 - Exceptionally Likely
-

For EACH PERSON LISTED BELOW, write the number in COLUMN 15

Appendix E: Demographic Questions

BACKGROUND INFORMATION

Please answer the following questions about your background and job experience. This information will be used to develop a profile of the participants in this study. Your responses will be kept completely confidential. Please record your answers on the computer sheet provided.

1. What is your sex? (circle one):

- (a) Male
- (b) Female

2. What is your race? (circle one):

- (a) White
- (b) Black
- (c) Hispanic
- (d) Asian
- (e) Other

**3. What is your age in years?
(circle one):**

- (a) Less than 20
- (b) 20-25
- (c) 26-30
- (d) 31-40
- (e) more than 40

**4. Highest education level completed?
(circle one):**

- (a) Did not complete High School
- (b) High School Diploma or GED
- (c) 2-Year College Degree
- (d) 4-Year College Degree
- (e) Other

**5. How many years have you been in
the Air Force? (circle one):**

- (a) Less than 2
- (b) 2 to 5
- (c) 6 to 10
- (d) 11 to 15
- (e) more than 15

**6. What is your present grade?
(circle one):**

- (a) E4
- (b) E5
- (c) E6
- (d) E7
- (e) E8 or higher

**7. About how many months have you
worked in the same work center?
(circle one):**

- (a) Under 2
- (b) 2
- (c) 3
- (d) 4
- (e) 5 or more

**8. What is your skill level?
(circle one):**

- (a) 1
- (b) 3
- (c) 5
- (d) 7
- (e) 9

Bibliography

- Beiser, M. "Components and Correlates of Mental Well-Being," Journal of Health and Social Behavior, 15: 320-327 (1974).
- Bourgeois, L. J., III. "On the Measurement of Organizational Slack," Academy of Management Review, 6: 29-39 (1981).
- Broedling, L. A., C. S. Crawford, G. D. Kissler, D. A. Mohr, A. R. Newman, M. A. White, H. Williams, L. Young, and T. J. Koslowski. "An Examination of Productivity Impediments in the Navy Industrial Community," (NPROC-TR-81-2, AD-A092 80851) San Diego: Navy Personnel Research and Development Center, (1980).
- Campbell, Wendy B. "An Organizational Perspective of Situational Constraints in Air Force Maintenance," Thesis, School of Systems and Logistics, Air Force Institute of Technology (AU), Wright-Patterson AFB OH (September 1985) (AD-A160872).
- Clark, L. A. and D. Watson. "Mood and the Mundane: Relations Between Daily Life Events and Self-Reported Mood," Journal of Personality and Social Psychology, 54: 296-308 (1988).
- _____. "Diurnal Variation in Mood: Interaction with Daily Events and Personality," Paper presented to the meeting of the American Psychological Association, Washington DC (1986)
- Cohen, Jacob and Patricia Cohen. Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences (Second Edition). New Jersey: Lawrence Erlbaum Associates, Publishers, 1983.
- Dunnette, M. D. "Aptitude, Abilities, and Skills," Handbook of Industrial and Organizational Psychology, 51: 473-520 (1976).

- Kane, W. D. "A Heuristic Model of Air Force Maintenance Performance" (Final Report), Cullowee NC: Western Carolina University, Southeast Center of Electrical Engineering Education (1981).
- _____. "Task Accomplishment in an Air Force Maintenance Environment," (AD-A101, 10819), Air Force Office of Science Research, Bolling AFB DC (1979).
- Kanner, A. D., J. C. Coyne, C. Schaefer, and R. S. Lazarus. "Comparison of Two Models of Stress Management: Daily Hassles and Uplifts versus Major Life Events," Journal of Behavior Medicine, 4: 1-39 (1981).
- Mobley, W. H. "Intermediate Linkages in Relationships Between Job Satisfaction and Employee Turnover," Journal of Applied Psychology, 62: 237-240 (1977).
- Mobley, W. H., R. W. Griffeth, H. H. Hand, and B. H. Meglino. "Review and Conceptual Analysis of the Employee Turnover Process," Psychological Bulletin, 86: 493-522 (1979).
- Naylor, J. D., R. D. Pritchard, and D. R. Ilgen. "A Theory of Behavior in Organizations," New York: Academic (1980).
- Nunnally, Jum C. Psychometric Theory (Second Edition). New York: McGraw-Hill Publishing Company, 1978.
- O'Connor, E. J., J. R. Eulberg, L. H. Peters, and T. W. Watson. "Situational Constraints Within the Air Force: Identification, Measurement, and Impact on Work Outcomes," (AFHRL-TP-84-10). Brooks AFB TX: Manpower and Personnel Division, Air Force Human Resources Laboratory (1984).
- O'Connor, E. J., L. Peters, A. Pooyan, J. Weekley, B. Frank, and B. Erenkrantz. "Situational Constraint Effects on Performance, Affective Reactions and Turnover: A Field Replication and Extension," Journal of Applied Psychology, 69: 663-672 (1984).

O'Connor, E. J., L. H. Peters, C. J. Rudolf, and A. Pooyan.
"Situational Constraints and Employee Affective
Reactions: A Field Replication," Group and Organization
Studies, 7: 418-488 (1982).

Peters, L. H., M. B. Chassic, H. R. Lindholm, E. J.
O'Connor, and C. R. Kline. "The Joint Influence of
Situational Constraints and Goal Setting on Performance
and Affective Outcomes," Journal of Management, 8: 7-20
(1982).

Peters, L. H., E. J. O'Connor. "Situational Constraints and
Work Outcomes: The Influences of a Frequently
Overlooked Construct," Academy of Management Review, 5:
391-397 (1980).

Peters, L. H., E. J. O'Connor, J. R. Eulberg, and T. W.
Watson. "An Examination of Situational Constraints in
Air Force Work Settings," Human Performance, 1: 133-144
(1988).

Peters, L. H., E. J. O'Connor, C. J. Rudolf. "The
Behavioral and Affecting Consequences of Performance -
Relevant Situational Variables," Organizational Behavior
and Human Performance, 25: 79-96 (1980).

Steel, R. P. and A. J. Mento. "Impact of Situational
Constraints on Subjective and Objective Criteria of
Managerial Job Performance," Organizational Behavior and
Human Decision Processes, 37: 254-265 (1986).

_____. "Situational Constraints Within Air Force Task
Environments," Military Psychology, 1: 57-71 (1989).

Steel, R. P., A. J. Mento, and W. H. Hendrix. "Constraining
Forces and the Work Performance of Finance Company
Cashiers," Journal of Management, 13: 473-482 (1987).

Stone, A. A. "The Association Between Perceptions of Daily
Experiences and Self- and Spouse-Rated Mood," Journal of
Research in Personality, 15: 510-522 (1981).

- Tessler, R. and D. Mechanic. "Psychological Distress and Perceived Health Status," Journal of Health and Social Behavior, 19: 254-262 (1978).
- Warr, P., J. Barter, and G. Brownbridge. "On the Independence of Positive and Negative Affect," Journal of Personality and Social Psychology, 44: 644-651 (1983).
- Watson, David. "Intraindividual and Interindividual Analyses of Positive and Negative Affects: Their Relation to Health Complaints, Perceived Stress, and Daily Activities," Journal of Personality and Social Psychology, 54: 1020-1030 (1988).
- Watson, David, Lee Anna Clark, and Auke Tellegen. "Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales," Journal of Personality and Social Psychology, 54: 1063-1070 (1988).
- Watson, T. W., E. J. O'Connor, J. R. Eulberg, and L. H. Peters. "Measurement and Assessment of Situational Constraints in Air Force Work Environments: A Brief Summary," Proceeding of the 25th Annual Conference of the Military Testing Association, 25: 662-667 (1983).
- Wills, T. A. "Stress and Coping in Early Adolescence: Relationships to Substance Use In Urban School Samples," Health Psychology, 5: 503-529 (1986).
- Zevon, M. A. and A. Tellegen. "The Structure of Mood Change: An Idiographic/Nomothetic Analysis," Journal of Personality and Social Psychology, 43: 111-122 (1982).

Vita

Captain Joseph T. Dougherty was born 27 January 1958 in Seattle, Washington. He entered Officers Training School after graduating from Washington State University. Subsequently, he attended technical school and was awarded a Transportation Officer AFSC in 1985. His first assignment was as Traffic Management Officer for the 305 AREFW at Grissom AFB, Indiana. In July 1986 he was assigned to the 475 ABW at Yokota AB, Japan where he was Chief of Vehicle Maintenance. After completing Squadron Officers School at Maxwell AFB, Alabama in September 1988, he was assigned to the 405 BMW at K.I. Sawyer AFB, Michigan as the Chief of Vehicle Operations. In November 1990, he was assigned to the 3d TFW at Clark AB, Republic of the Phillipines as Chief of Operations and Combat Resources. His previous assignment was at the 603 Aerial Port Squadron, Kadena AB, Japan as Chief of the Air Passenger and Air Freight Sections. Upon graduation from the Air Force Institute of Technology, he will be assigned to the 640 Air Mobility Support Squadron at Howard AFB, Panama.

Permanent Address: 2116-N-44
Seattle WA 98103

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 instructions, 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 September 1995		3. REPORT TYPE AND DATES COVERED Master's Thesis
4. TITLE AND SUBTITLE EFFECTS OF SITUATIONAL FACTORS ON THE WORK PERFORMANCE OF AERIAL PORT TECHNICIANS				5. FUNDING NUMBERS
6. AUTHOR(S) Joseph T. Dougherty, Captain, USAF				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Institute of Technology 2950 P Street WPAFB OH 45433-7765				8. PERFORMING ORGANIZATION REPORT NUMBER AFIT/GTM/LAR/95S-5
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSORING/MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited				12b. DISTRIBUTION CODE
13. ABSTRACT (Maximum 200 words) This research investigated the impact of situational factors on aerial port productivity. Results showed constraints had little impact on performance. However, perceptions of constraints and performance were significantly related to individual differences in temperament.				
14. SUBJECT TERMS Situational Constraints Work Performance Affectivity Experience Perception				15. NUMBER OF PAGES 78
				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	