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Assessment of Aircrew Stress

By

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Aircrew Health and Performance Division

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A questionnaire was developed and administered to 21 aircrew members of a medical evacuation unit. Respondents were asked about the causes of stress in their lives, coping skills, belief systems, and stress symptoms. Scores on 21 scales within these 4 categories were quantified and analyzed using correlations and regression analysis, to reveal problem areas, strengths, and interrelationships. A stress profile was generated for this unit, indicating strengths in the areas of relationship stability and relational rewards, but pointing to work changes and ongoing work pressures as significant stressors. Crewmembers use active, flexible problem-solving to their benefit in coping with stressors, but fail to seek support from others and often attempt to control the uncontrollable. Respondents are optimistic with a healthy self-esteem, but avoid expressing their own thoughts and feelings and believe they are powerless to impact their own lives. A symptom model was generated, illustrating the connection between a perceived lack of work rewards and physical and behavioral symptoms and the connection between harboring resentments and behavioral and emotional symptoms, for this unit. In addition, a pessimistic outlook was found to be related to physical symptoms and (Continued)

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relationship pressures were related to emotional symptoms. Recommendations focused on how this information might be used by the unit command to guide efforts in minimizing unneccesary stress and optimizing crewmembers' ability to cope. The study demonstrated the utility of this questionnaire for assessing unit-specific stress factors and guiding interventions.

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Introduction

The construct of stress lacks a universally accepted definition. Although stress is viewed at the most basic level as the body's response to demands, most sources extrapolate and vary this general concept to apply more specifically and meaningfully to the questions being addressed. A working definition of stress that emphasizes its relationship to positive and negative changes and everyday events would be particularly useful to the current study, because aviators tend to deny and defend against feelings associated with a loss of control (Bentley, 1986; Byrnes and Black, 1993). For the purposes of this assessment, we will define stress as a positive or negative response condition of the individual that arises from a subjective appraisal of demands, constraints, and/or opportunities (derived from Martin and Schermerhorn, 1983).

Military significance

The direct military significance of the effects of stress is extensive. A number of impairments in human performance have been associated with depressive states resulting from life stress (Johnson and Magaro, 1987). Sohlberg (1976) and Noy (1978) reported relationships between family stress and combat stress casualties in wartime. Naval personnel reported significantly decreased job satisfaction in relation to negative stressful life events (Sarason and Johnson, 1979). A study of Gulf War personnel found combat-related stress as just one set of interacting stressors aggregating to burden our forces and pointed to the disrupting influence of family stresses in soldiers' lives (WRAIR, 1994).

Military aviators' psychological stress effects in particular involve a unique combination of factors superimposed on a critical need for a high level of performance (Hawkins, 1987). These factors include, but are not limited to, disrupted circadian rhythms, domestic problems, occupational insecurity, and personality characteristics which may not be optimal for coping.

The current assessment addressed the causes and effects of chronic or life events stress experienced by aircrew members. The following section presents an overview of the general physiological and psychological effects of chronic stress and applies these concepts specifically to the Army aviator in terms of performance, personality factors, and coping skills.

Physiological and psychological effects

The occurrence of a stressor (an external factor which causes stress within the individual) activates the sympathetic nervous system's fight-or-flight response. This is characterized by adrenaline release, increases in heart rate, blood sugar and blood pressure, respiratory and digestive changes, pupil dilation, increases in muscle tension, and activation of adrenocorticotropic hormones (Mills, 1985). This acute *alarm stage* reaction serves an energizing function and is normally followed by a *resistance stage*, in which the body repairs any damage caused by the stress. However, the stress response becomes problematic when the excessive autonomic arousal continues, as is the case with an accumulation of life event

stressors. The body remains in a constant state of readiness for fight or retreat, leading to *exhaustion,* or *burnout* (Selye, 1979).

The more life stress events one experiences, the more likely one is to suffer a decline in health. Stressful life events have been empirically linked to the onset and severity of peptic ulcers, ulcerative colitis, bronchial asthma, heart disease, hypertension, insomnia, headaches, alcoholism, tuberculosis, multiple sclerosis, and diabetes (Bhagat and Allie, 1989; Selye, 1979). An extensive body of literature supports this link between stressful life events and health risks (for reviews, see Bhagat and Allie, 1989; Dohrenwend and Dohrenwend, 1974). Research on stressful life events typically uses a life stress scale (Holmes and Rahe, 1967) either prospectively or retrospectively to quantify major and minor, positive and negative changes over the past 2 years. For example, Alkov, Borowsky and Gaynor (1983) found that 79 percent of subjects with over 300 life change units (LCUs) reported associated injuries or illnesses. Of those with 200-299 LCUs, 51 percent reported associated health changes, and of those experiencing 150-199 LCUs, 37 percent reported associated health changes. Casey, Thoresen, and Smith (1970) found that of Army personnel who reported on sick call, those with the highest LCU scores were more likely to require sophisticated evaluation and treatment other than that offered at the dispensary level. Studies of naval personnel have routinely showed correlations between positive life-change events such as marriage, promotion, and vacation, and subsequent illness (Rahe, 1974; Myers, Lindenthal, and Pepper, 1974).

The stress/illness relationship is of particular military importance, given that the fundamental mission of the military is to be ready at all times to fight the enemy anywhere. A study of Gulf War personnel found that 40 percent of reservists and 34 percent of active duty soldiers complained of personal health concerns, regardless of exposure to combat (WRAIR, 1994). Several case studies of military aviators in particular have shown that family problems can lead to tension headaches, alcohol abuse, air sickness, depression (Senechal and Traweek, 1988), sleep and eating disturbances, and self-medication (Antolick, 1994).

Stressful life events have also been linked to psychological problems such as anxiety and depression (Finlay-Jones and Brown, 1981; Sarason and Johnson, 1979). Under high levels of chronic stress, people often feel desperate, trapped, and helpless. These psychological correlates may manifest themselves in subtle behavioral symptoms, such as rushing one's speech, eating quickly, detesting 'wasting' time, trying to do several things at once, driving too fast, and becoming impatient with others (Jensen, 1995).

Stress and the aviator

The past decade has seen a growing recognition that family problems affect the ability of the soldier to maintain his or her level of combat effectiveness (Van Vranken et al., 1984). One study cited 71 percent of military pilots as admitting to being worried by personal and domestic problems during the previous year (Aitken, 1969), and domestic stress on the pilot has been shown to affect flying efficiency (Haward, 1974).

Intricately related to the domestic stress of pilots is the need for U.S. Army aviators to cope with unpredictable schedules which disrupt social and family activities and result in irregular work/rest cycles. In addition to the disturbing influence of scheduling and/or transmeridian flying on the aviators' circadian rhythms, this disruption results in domestic overload for the pilots' spouses. This role overload has been cited by pilot's spouses as the one aspect of life causing the most dissatisfaction (Cooper and Sloan, 1985).

Performance

It has long been known that stress can produce certain characteristic types of pilot error in wartime environments (Davis, 1949). But with human error emerging as the most common cause of peacetime aviation accidents (Billings and Reynard, 1984; Little et al., 1990; Trollip and Jensen, 1991), and with the advent of military downsizing and related stresses (Evans, 1995), the military community is becoming increasingly concerned with the effects of life stress on performance (Helmreich and Foushee, 1993). In fact, life-change stress has been suggested as the most significant of all the stressors in terms of aviation accident causation (Green, 1985). Labels such as failing aviators (Voge, 1989) and aviators at risk (Raymond and Moser, 1995) have appeared in the recent literature to denote crew members whose performance is adversely affected by excessive levels of psycho-social stress.

Several studies have linked stress factors such as pilot career strain, financial setbacks, and interpersonal problems to aircraft mishaps (Alkov, Borowsky, and Gaynor, 1985; Little, et al., 1990; Wiant et al., 1991). Alkov, Borowsky, and Gaynor (1985) found that naval aviators who showed symptoms of inadequate stress coping were more likely to be involved in an aircraft mishap in which they played a contributory role. Pilots from units with high accident rates worry more, particularly about flying, bereavement, spouse, and love-life (Aitken, 1969). At-fault naval aviators involved in aircraft accidents were found to have made significant marital and career changes in the recent past (Alkov, Borowsky, and Gaynor, 1982).

Tunnel vision

Significant life events may intrude on attention and distract the pilot from properly monitoring navigational instruments (O'Hare and Roscoe, 1990). The specific mechanism by which this happens is often described in literature as a tunnel vision effect. It has been found that stress can cause an aviator to give an isolated area undivided attention when his or her attention needs to be more widely distributed (Benjamin, 1984). Thus, operation-related information may be displaced by distracting stress effects (Butler, 1993). As stress increases, the aviator's ability to attend to secondary tasks decreases and attention becomes more narrowly focused on the central task (Hockey, 1970).

While flying, aviators may be confronted by acute situational factors when their coping abilities are diminished by preoccupation with psycho-social stressors, thus increasing the

potential for mishap (Peel, 1992). The stress related to flying varies as a function of task requirements, and the crew members' ability to cope with that stress varies as a function of fatigue, coping skills, and degree of chronic stress brought into the cockpit (Ruffel-Smith, 1979).

Figure 1 illustrates a theoretical model depicting how the margin of safety decreases as task requirements increase around the approach and landing phase, while the pilot's capabilities decrease due to fatigue (Jensen, 1995).

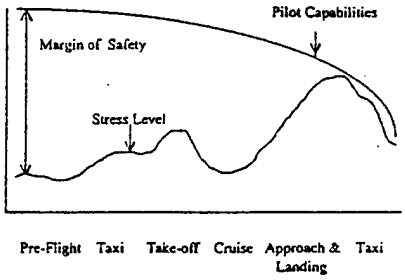

Figure 1. Conceptual diagram of margin of safety over the duration of a typical flight.

If an abnormality or distraction occurs to increase the task demands (Jensen, 1995), and/or if the pilot's capabilities are reduced due to an increased level of underlying chronic stress, an accident is risked (Byrnes and Black, 1993). As the margin of safety is breached, an otherwise effective and orderly process can break down--checklist items can be skipped, possible solutions to problems may remain unexamined (Ruffel-Smith, 1979), and crewmembers may revert to early response patterns inconsistent with the training they have received (Butler, 1993). See figure 2.

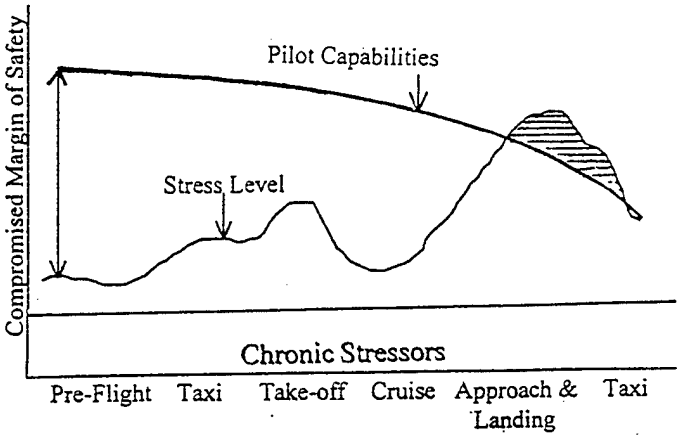

Figure 2. Compromised margin of safety due to chronic stress.

In short, underlying chronic stress may reduce the aviator's ability to respond properly, either in a normal situation or in a crisis. A build-up of life stressors from whatever source or combination of sources can render the aviator inefficient and either directly or indirectly produce a fatal result (Benjamin, 1984). Jensen (1995) states that it is especially important for pilots (who must preflight themselves before every flight) to recognize when they are overly stressed to the extent that their performance could be adversely affected.

More empirical evidence on the role of life stress in performance errors would be of great value to the aviation community (O'Hare and Roscoe, 1990). Helmreich and Foushee (1993) state that the topic of psychological stress and its behavioral impact has languished in the research community and needs renewed attention. They add that only when the research base in this area is extended will we be able to mount effective stress management programs and evaluate their operational impact.

Personality

Personality clearly influences the way we react to stress (Jensen, 1995), and the typical pilot personality may not be optimal in this regard (Hawkins, 1987). Successful aviators tend to be perfectionistic, controlling, and action-oriented problem solvers (Jones, 1985) with obsessive-compulsive and Type A qualities. While these characteristics may be condoned within aviation circles, they may lead to difficulties in other settings (Alkov, Borowsky, and Gaynor, 1982). An aviator's fear of making mistakes, of being criticized, and of doing less than a perfect job may lead to either an internalization of stress (withdrawal, depression) or an acting out with anger and blaming. These traits may cause personality conflicts, disrupt group functioning, and interfere with crew coordination (Alkov and Borowsky, 1980). The typical pilot denies his internal emotional life and possesses inadequate strategies for coping with feelings (Ursano, 1980). Under stress, he or she is likely to seek a constructive solution and to act out frustrations if the particular objective is not achieved (Hawkins, 1987). In addition, aspects of the aviator's Type A personality style, such as competitiveness, aggressiveness, being achievement-oriented, and being time-dominated, may be associated directly or indirectly with heart disease (Thomas, 1989).

These prevalent personality characteristics must be considered when attempting to address stress issues with pilots. Communicating the relevant facts without excessive reliance on psychological terms may be beneficial in countering prevailing attitudes of invulnerability, denial, and defensiveness. Survey research has indicated that pilots harbor a dislike for a psychotherapeutic approach to problem-solving (Byrnes and Black, 1993). Aviators prefer the cognitive behavioral approach to managing stress over psychodynamic approaches, perhaps because of the problem-oriented logic inherent in cognitive behavioral precepts (Banken and Mahone, 1991: Aitken et al., 1971).

We have seen that the military aviator faces a unique cocktail of stressors for which he or she is likely to be ill-equipped to cope. Now we'll look at the construct of coping and how it may

apply to aircrew members, with attention to their common personality characteristics described above and the associated belief systems.

Coping

Rahe (1974) defines coping as one's ability to reduce physiological activation. He postulates a coping *filter* as a mediator between a life event change and a resultant potential stress-related illness. The filter allows one to absorb certain of the body's physiological activations, such as a subject's ability to relax, to diminish a rapid pulse rate.

The most critical coping filter involves perception as the intervening variable between the occurrence of an event and the emotional reaction to that event. Referring back to our working definition of stress, recall that stress arises from a *subjective appraisal* of demands, constraints and opportunities, and not from the occurrence of those events per se. A primary appraisal process takes place in response to a potential stressor, in which one asks 'Am I okay or in trouble?' (Folkman, Schaefer, and Lazarus, 1979).

An extensive body of empirical research has indicated that damage from a stressor arises from an individual's response to it, rather than the stressor itself. Byrne and Whyte (1980) found that myocardial infarction victims did not differ from non-victims in terms of amount of stressful life events, but did differ significantly in terms of their perceptions of the events. The victims reported a much greater degree of emotional distress related to the life events than the non-victims. Fairbank and Hough (1979) found that subjects are more likely to experience a stress-related illness if they perceive that they should have been able to avoid, prevent, or better handle the occurrence of the stressors. In Hinkle's (1974) studies of people exposed to major life changes, he noted that the healthiest members of their samples often showed little psychological reaction to events and situations which caused profound reactions in other members of the group.

The quality of an individual's perception of a stressful situation may be related to that person's personality, and has in fact been found to be associated with the extent of Type A behavior he or she exhibits (Schuler, 1980). An aviator, for example, may be prone to beliefs such as *I should never make mistakes*, and may thus perceive any criticism from his wife as extremely stressful. He is likely to cope with those feelings by using denial. Through denial, one interprets information as incorrect ('there is no danger'), thus minimizing the stress response. It is easy to see how this may serve a valuable purpose as a temporary coping mechanism in military aviation, by dampening feelings that would distract the aviator from action that is needed immediately in the service of the mission. However, in social relationships, denial is maladaptive, because confrontation with reality becomes more intense when it occurs (Warburton, 1979). To continue our example, the pilot's wife repeats her concerns with increasing emphasis and increasing frustration as the pilot's denial continues. As the domestic stress level increases, it invades every area of the aviator's functioning. Hawkins stated that frustrations at home can usually be expected to be reflected in attitudes at work, and frustrations

at work can frequently be expected to influence harmony at home. (Hawkins, 1987).

This review has explored the relationship between ongoing stresses and physical illness, with clear implications for military readiness. It has examined the psychological effects of life event stress and its potential impact on the military aviator's performance in the cockpit. It has delineated some of the components of the stress mosaic with which the military aviator must cope, and postulated that the typical pilot's personality characteristics may not equip him to cope effectively with these stressors. The next section looks at the current state of the field and suggests a practical future direction for the military aviation community.

State of the field and future directions

Recent articles addressing aviator stress list symptoms of inadequate stress coping (Peel, 1992; Raymond and Moser, 1995; Trollip and Jensen, 1991). They urge aviation personnel to become familiar with stress warning signs and training programs to address the detrimental effects of emotional stress on aviation safety. This approach is admittedly less reactive than in the past, when the literature consisted of case descriptions and retrospective studies linking life stress factors to aircraft mishaps. However, this shift in focus is equivalent to progressing from a *tertiary prevention* to a *secondary prevention* model, from asking what went wrong in these cases to asking whether these things are going wrong in the current case.

It may be beneficial for military research efforts to be directed toward the development of a more proactive *primary prevention* approach to managing stress with aircrews. The goals of such an approach would be 1) educating aircrew members and aviation leadership about the relationship between belief systems and emotional states; 2) discussing the potential use of a process whereby the aviator might identify the specific, controllable aspects of his or her stress and challenge the irrational beliefs driving the related stress reactions; and 3) teaching aviators and their spouses key interpersonal communication skills, such as active listening, to reduce domestic stress levels.

The state of the field asks aviators to remain aware of signs in their own lives that stress levels may be reaching detrimental levels, and perhaps unrealistically, expects them to make this known to command leadership. The proactive approach proposed here shifts the locus of control to the aviator himself by arming him with the skills to *manage* the stress in his own life *before* it reaches detrimental or potentially hazardous levels. Furthermore, it does so using cognitive techniques, which have been shown to be well-received by military personnel (Banken and Mahone, 1991; Aitken et al., 1971).

Experimental design objectives

Preliminary to developing and implementing an individualized unit-specific program, certain pertinent questions remain to be addressed. The objective of this research was to demonstrate the

utility of a stress assessment measure by providing empirical evidence with a U.S. Army medical evacuation unit regarding the following questions:

1. What do aircrew members identify as causes of stress in their lives? What changes and pressures are part of their everyday work and personal lives?

2. How do aircrew members currently cope with stress, and how well do their current coping styles work? Are their coping styles helping or hindering their efforts to manage stress?

3. What are aircrew members' belief systems? Do their attitudes and world views help or hinder their ability to cope with stress?

4. To what extent are aircrew members experiencing physical, behavioral, or emotional symptoms that reflect chronic difficulty in managing life and work stress? How are those symptoms related to stressors, coping styles, and belief systems?

5. How are stressors, coping styles, and belief systems interrelated?

The data generated in this study are intended to: a) demonstrate the utility of the stress assessment device towards addressing these issues with other units; b) guide the further development and refinement of a military-applicable stress assessment packet; and c) define salient areas to be addressed by stress management interventions designed for military aviators.

Methods

Subjects

Twenty-one volunteers from a medical evacuation unit of 34 aircrew members participated in this study. The mean age of participants was 28 (range 24-35). Nine volunteers were pilots, seven were emergency medical personnel, and five were firefighters. One respondent was female, all others were male. These figures were consistent with the demographic makeup of the 34-member unit as a whole.

Procedures

The primary investigator briefed crew members on the purposes and requirements of the assessment in conjunction with a regularly scheduled mandatory training meeting. After obtaining informed consent in accordance with Human Use policies, the assessment forms were distributed to crew members. They were asked to complete the questionnaire independently within the following week and return the completed assessment to a lockbox located at the unit. The assessment, which takes approximately 1 hour to complete, was administered on this single occasion. The principle investigator then collected the completed forms.

Through the briefing and cover materials, crew members were informed that the purpose of the assessment was to identify their stressors and thereby potentially inform the investigator as to the types of services that would best meet their needs as a group.

To elicit honest responses and alleviate concerns about confidentiality, no space was provided for crew members' names on the assessment forms, and they were encouraged not to provide identifying information. The lockbox was used in order to reduce concerns about maintaining anonymity amongst coworkers.

The questionnaire

A questionnaire was developed that was similar to one designed and validated as a stress self-assessment guide (Orioli, Jaffe, and Scott, 1987). A copy of the final version of this questionnaire is presented in appendix A.

The assessment contains 271 items, each scored on a 4-point Likert scale from *None*, *Never*, or *Not At All* (0) to *Great*, *Almost Always*, *Very Much Like Me*, or *Nearly Every Day* (3). These items make up 21 scales related to 4 factors: stress causes, coping styles, belief systems, and stress symptoms.

Part I. Stress causes

Scales 1-6 address changes, pressures, and rewards in both work and personal environments. Included are family pressures, finances, social supports, and changes and stresses related to working conditions. These scales were derived from life change research, work-stress research, and family satisfaction and support research.

Part II. Coping styles

Questions pertaining to crew members' coping styles comprise scales 7-12. These include: self-care, direct action, support seeking, situation mastery, flexibility, and time management. These scales assess whether current coping styles help or hinder the respondent's efforts to manage stress. They were derived from health-habits, locus-of-control, social support, and Type A personality research areas.

Part III. Belief systems

Scales 13-18 measure six different patterns of thinking and feeling, which could be conceptualized as attitudes about the world or belief systems. These include: self esteem, positive outlook, personal power, connection, expression, and compassion. These were drawn from cognitive therapy and from hardiness, coherence, locus-of-control, and anger research.

Part IV. Stress symptoms

This section contains scales 19-21, which indicate the degree to which a respondent is experiencing physical, behavioral, or emotional stress symptoms. These scales were derived from common stress-symptom checklists.

Table 1 describes each scale specifically and presents the implications of a high score versus a low score in each scale.

Data analysis

Each subject's numerical (0-3) responses were summed for each of the 21 scales, yielding 21 scores per subject. When appropriate for the data analysis and/or to simplify results for descriptive purposes, each of the scale scores were then categorized as one of four performance levels based on pre-established criterion cutoffs. These re-coded data were labeled Strength, Capability, Strain, and Distress, to indicate the degree to which the crewmember was helped or hindered by that particular area. Specifically, performance which is in the Strength range indicates a high level of effectiveness, even when under pressure. Capability indicates effective and steady performance in most situations. Strain-level performance indicates frequent difficulty and a sense of feeling overwhelmed or drained. Distress suggests severe difficulty and impaired functioning. Scores in the Strength and Capability zones, then, reflect adequate functioning, while scores in the Strain and Distress zones reflect areas in need of attention. Coding scores in this manner allowed numerically descriptive statements to be made about this medical evacuation unit and provided for an objective identification of areas to be targeted by stress management efforts.

The data from the questionnaire were used to produce descriptive statistics. They were further analyzed using Pearson Product Moment Correlations to determine the relationships among scale scores. Finally, multiple regression analyses were used to determine the predictive relationships between scale scores and stress symptoms. Statistica v4.5 was used for all statistical analyses. Significance levels were set at $p<.001$ to control for p-inflation associated with the numerous tests carried out and to highlight only the most salient relationships.

Table 1.
Scale implications.

Scale	**Strength**	**Distress**
Work Changes	Not many variations at work	Many work changes needing transition
Work Pressures	Not many ongoing, daily pressures at work (past month)	Many ongoing work relationships/ situations perceived as draining
Work Rewards	Work relations/situations fulfilling	Extreme job frustration, lack of feeling valued
Relational Changes	Not many changes in relations with mate, family, friends	Many changes requiring adaptation in personal relationships
Relational Pressures	Not many ongoing, daily pressures from personal relations	Many ongoing personal relationships/situations perceived as draining
Relational Rewards	Personal relationships perceived as fulfilling	Extreme frustration with support systems and opportunities for growth
Self Care	Maintains nutrition, exercise, rest, hygiene	Neglects self, disregards personal well-being
Active Problem-Solving	Makes decisions, takes actions consistent w/ goals	Avoids, procrastinates, postpones completion of goal, task, or purpose
Support Seeking	Asks others for help	Withdraws, unwilling to share needs
Control	Acts when situation controllable, recognizes when it's beyond control	Endless struggle to control the uncontrollable
Flexibility	Shifts gears, changes directions to manage problems	Rigid unwillingness to shift from automatic reactions that don't work
Time Management	Organized use of time	Disorganized, chaotic
Self Esteem	Attitude of genuine positive self-regard, sense of worth	Self critical, dissatisfied with self and achievements
Optimism	Sees bright side, views world with hope	Pessimistic, expects worst, views world as futile, gloomy
Power	Capacity to make things happen, get what's needed	Helpless, incapable of helping self or fulfilling own needs
Purpose	Highly motivated, sense of meaning and accomplishment	Detached, alienated, finds little meaning in life
Self Expression	Shares thoughts, feelings directly or indirectly	Internalizes thoughts, feelings, hiding them from others and self
Empathy	Accepts individual differences	Resentment, blaming, impatience, anger
Physical Symptoms	Good health, well-being	Severe disrepair, pains, illnesses
Behavioral Symptoms	Avoids self-defeating behaviors, changing or managing source of stress	Reacts to stress with behaviors that ultimately increase stress and cause more problems
Emotional Symptoms	Finds ways to express and release negative feelings	Harbors doubts, fears, worries, depression, apathy, irritability

Results and discussion

Causes of stress

1. *What do aircrew members identify as causes of stress in their lives? What changes and pressures are part of their everyday work and personal lives?*

Table 2 presents a breakdown by performance level of the six stress cause scales. A high percentage of endorsements indicates that a particular stressor is frequently identified as a source of strain or distress.

Table 2.
Stress causes by performance level.

	Work Change	Work Pressure	Work Reward	Relational Change	Relational Pressure	Relational Reward
% Strength/ Capability	38	48	52	62	57	71
% Strain/ Distress	62	52	48	38	43	29

Changes in the work environment were identified as causing a disruptive degree of stress for 62 percent of the respondents. Fifty-two percent of respondents identified ongoing work relationships and situations as draining.

Most of the respondents (71 percent) perceive their personal relationships, including family and friends, as fulfilling and rewarding, with few changes in the past year (62 percent).

Coping styles

2. *How do aircrew members currently cope with stress, and how well do their current coping styles work? Are their coping styles helping or hindering their efforts to manage stress?*

Table 3 presents a breakdown of coping styles by performance level. Scores indicating that a particular stress response style is a strength or capability suggests that the manner of coping is being used beneficially for that crew member, while the inability to use a coping style to one's benefit is suggested by strain- or distress-level performance.

Table 3.
Coping styles by performance level.

	Self Care	Active Prob.Solving	Support Seeking	Control	Flexibility	Time Management
% Strength/ Capability	52	71	43	33	62	48
% Strain/ Distress	48	29	57	67	38	52

Most of the crew members (67 percent) report having their coping abilities hindered by a struggle to control situations in their lives that are beyond their control. Fifty-seven percent of respondents indicate difficulties in seeking help from others, tending instead to withdraw. About half the respondents (52 percent) report an inability to manage their time in an organized manner.

Aiding their ability to manage stress are their tendencies to make decisions and respond in an active manner (71 percent) and their willingness to change directions when problem solving (62 percent).

Belief systems

3. *What are aircrew members' belief systems? Do their attitudes and world views help or hinder their ability to cope with stress?*

Table 4 presents a breakdown of belief systems by performance level. A high percentage of scores in the strength/capability zone indicates that crew members are able to use a particular style of thinking about the world to their benefit. Scores in the strain/distress zone suggest that a way of thinking about the world hinders crew members' ability to cope with stress.

Table 4.
Belief systems by performance level.

	Self Esteem	Optimism	Power	Purpose	Self Expression	Empathy
% Strength/ Capability	67	71	48	62	48	52
% Strain/ Distress	33	29	52	38	52	48

About half the respondents (52 percent) indicated problems with feeling helpless and incapable of fulfilling their own needs. The same percentage endorsed responses indicating a problematic level of internalizing thoughts and feelings, rather than sharing them with others.

Most of the crew members (71 percent) report optimistically viewing the world with hope and finding the bright side of situations. Sixty-seven percent indicate a strong sense of worth and positive self-regard. Sixty-two percent report being motivated by a sense of meaning and accomplishment in their lives.

Symptoms

4. *To what extent are aircrew members experiencing physical, behavioral, or emotional symptoms that reflect chronic difficulty in managing life and work stress? How are those symptoms related to stressors, coping styles, and belief systems?*

Table 5 presents a breakdown of symptom types by performance level. Scores in the strength/capability range indicate a paucity of stress symptoms in that area while those in the strain and distress zones suggest a problematic level of symptomatology.

Table 5.
Stress symptoms by performance level.

	Physical Symptoms	Behavioral Symptoms	Emotional Symptoms
% Strength/ Capability	76	67	71
% Strain/ Distress	24	33	29

Most of the respondents indicated few stress symptoms in any of the three areas. A case-by-case analysis revealed that 62 percent of the respondents scored in the strength/capability range in all three areas, with the remaining 38 percent scoring in the strain/distress range in at least one symptom area. One-third (33 percent) of the respondents indicated a problematic degree of behavioral symptoms, or self-defeating behaviors, that ultimately increase stress and cause further problems.

Table 6 presents the Pearson correlation coefficients of all 18 scales with the 3 symptom scales. Physical symptoms were significantly negatively correlated with Optimism ($r=-.72$, $p<.001$), Power ($r=-.67$, $p<.001$), and Empathy ($r=-.68$, $p<.001$). Manifestations of chronic stress in the form of pain and illness were associated with a pessimistic outlook, feelings of helplessness and harboring resentment, blame, impatience, and anger towards others.

Behavioral symptoms were significantly correlated with Relational Pressures (r=.68, p<.001) and negatively correlated with Empathy (r=-.75, p<.001). Self-defeating behaviors were associated with perceiving personal relationships and situations as draining and harboring resentment, blame, impatience, and anger towards others.

Emotional symptoms were significantly correlated with Relational Changes (r=.70, p<.001) and Relational Pressures (r=.75, p<.001), and negatively correlated with Empathy (r=-.77, p<.001). Anxiety and depression were associated with experiencing many changes in personal relationships in the past year, perceiving personal relationships and situations as draining, and harboring resentment, blame, impatience, and anger towards others.

Table 6.

Correlation of causes, coping, and beliefs scales with symptoms.

Scale	Physical Sxs	Behavioral Sxs	Emotional Sxs
Work Changes	.11	.37	.41
Work Pressures	.38	.60	.54
Work Rewards	.21	.01	-.17
Relational Changes	.40	.60	.70*
Relational Pressures	.37	.68*	.75*
Relational Rewards	-.35	-.43	-.39
Self Care	-.44	-.26	-.14
Active Problem Solve	-.36	-.18	-.33
Support Seeking	-.29	.03	-.05
Control	-.25	-.24	-.46
Flexibility	-.32	-.46	-.62
Time Management	-.41	-.16	-.41
Self Esteem	-.44	-.50	-.50
Optimism	-.72*	-.59	-.66
Power	-.67*	-.42	-.63
Purpose	-.47	-.48	-.63
Self Expression	-.51	-.32	-.20
Empathy	-.68*	-.75*	-.77*

* p<.001, n=21

Regression analyses were conducted using the 3 symptom scales as dependent variables and each of the other 18 scales as predictor variables. The results are presented in table 7.

Table 7.
Regression summaries for symptom types.

Scale	Physical Sxs	Behavioral Sxs	Emotional Sxs
1	b=-.20 P=.640	b=-.26 p= .000029	**b=-.53 P= .047**
2	b= .03 P=.944	b= .48 P= .000010	b= .13 P= .422
3	**b=-.56 P=.139**	**b=-.61 P= .000002**	**b=-.35 P= .043**
4	b=-.02 P=.926	b= .12 p= .000063	b= .14 p= .221
5	**b= .98 P=.160**	b= .45 P= .000015	**b= .70 P= .041**
6	b= .15 p=.723	b=-.24 P= .000035	**b=-.55 P= .045**
7	b=-.28 p=.500	b= .06 P= .000521	b=-.28 p= .125
8	b= .86 P=.240	b= .36 P= .000029	b= .04 P= .826
9	b= .74 P=.332	b=-.08 P= .000711	b= .23 P= .343
10	b= .21 P=.460	b= .18 P= .000024	b= .32 P= .051
11	b=-.55 P=.345	b=-.34 p= .000025	b=-.24 P= .238
12	b=-.38 P=.422	b=-.38 P= .000015	b=-.51 P= .052
13	b= .15 P=.666	b=-.08 P= .000184	b= .35 P= .075
14	**b=1.11 P=.066**	b= .27 P= .000018	b= .14 P= .278
15	b= .26 P=.542	**b=-.81 P= .000003**	b= .06 P= .642
16	**b=-1.79P=.118**	b= .49 P= .000027	b= .63 P= .101
17	b=-.13 P=.788	b=-.33 P= .000026	**b=-.72 P= .037**
18	b= .32 P=.478	**b= .96 P= .000002**	**b= .60 P= .037**
R	.9844	.9999	.9984
F(18,2)	3.485 (p<.246)	250982.0 (p<.000004)	34.885 (p<.028)

Bolded values indicate the most statistically significant predictors within each symptom type.

Scales:

Stressors
1. Work Changes
2. Work Pressures
3. Work Rewards
4. Relational Changes
5. Relational Pressures
6. Relational Rewards

Coping Style
7. Self Care
8. Active P. Solve
9. Support Seeking
10. Control
11. Flexibility
12. Time Management

Belief System
13. Self Esteem
14. Optimism
15. Power
16. Purpose
17. Self Expression
18. Empathy

The most significant predictors of physical symptoms were: pessimism, lack of purpose, few work rewards, and many work pressures. Using these scales as the independent variables, a separate multiple regression analysis was performed to determine which of these variables account for the most variability in physical symptom scores. The results are presented in table 8.

Table 8.
Regression analysis for physical symptoms.

Variable	Beta	Partial Corr.	Semipartial Correlation	% Total Variance	Residual Var .%	t(16)	p-level
Scale 3	.43699	.560640	.376188	14	31	2.70821	.015509 *
Scale 5	.38784	.454672	.283641	8	20	2.04196	.057999
Scale 14	.85384	.686721	.524899	28	47	3.77879	.001645 *
Scale 16	-.3236	-.314601	-.184151	3	10	-1.3257	.203551

* $p < .05$

Pessimism was found to be the best predictor of physical symptoms, accounting for 28 percent of the total variance in physical symptom scores, and 47 percent of the scores when adjusted for the variance contributed by all other scales (p=.0016). The absence of adequate work rewards was also highly predictive of physical symptoms, accounting for 14 percent of total variance and 31 percent of residual variance (p=.0155).

The most significant predictors of behavioral symptoms (self-defeating behaviors) were: a lack of empathy, few work rewards, and helplessness. Using these scales as the independent variables, a separate multiple regression analysis was performed to determine which of these variables account for the most variability in behavioral symptom scores. The results are presented in table 9.

Having few work rewards was found to be the best predictor of behavioral symptoms, accounting for 17 percent of the total variance in behavioral symptom scores and 57 percent of the scores when adjusted for the variance contributed by all other scales (p=.0004). Harboring resentment towards others was also highly predictive of behavioral symptoms, accounting for 16 percent of total variance and 56 percent of residual variance (p=.0005).

Table 9.
Regression analysis for behavioral symptoms.

Variable	Beta	Partial Corr.	Semipart Corr.	% Total Variance	Resid. Var.	t(15)	p-level
Scale 2	.31404	.528264	.221228	5	28	2.40962	.029269
Scale 3	.50356	.756136	.410851	17	57	4.47500	.000445 *
Scale 5	.46080	.642554	.298182	9	41	3.24781	.005408 *
Scale 15	-.3891	-.574135	-.249341	6	33	-2.7158	.015944 *
Scale 18	.70932	.748916	.401861	16	56	4.37709	.000541 *

* $p < .05$

The most significant predictors of emotional symptoms (doubts, fears, etc.) were: resentment, failure to share thoughts and feelings, many relational pressures, few work rewards, few relational rewards, and many work changes in the past year. Using these scales as the independent variables, a separate multiple regression analysis was performed to determine which of these variables account for the most variability in emotional symptom scores. The results are presented in table 10.

Table 10.
Regression analysis for emotional symptoms.

Variable	Beta	Partial Corr.	Semipart Corr.	% Total Variance	Resid. Var.	t(14)	p-level
Scale 1	.04896	.092615	.038901	0.15	0.9	.34803	.732997
Scale 3	.16328	.283601	.123688	1.5	8	1.10657	.287131
Scale 5	.55821	.647540	.355391	12.6	42	3.17949	.006688 *
Scale 6	.21694	.329393	.145903	2.1	11	1.30532	.212829
Scale 17	-.1968	-.337407	-.149903	2.2	11	-1.3411	.201240
Scale 18	.69993	.722290	.436793	19	52	3.90775	.001577 *

* $p < .05$

Harboring resentment towards others was found to be the best predictor of emotional symptoms, accounting for 19 percent of the total variance in emotional symptom scores and 52 percent of the scores when adjusted for the variance contributed by all other scales (p=.0016).

Experiencing many ongoing relationship pressures was also highly predictive of emotional symptoms, accounting for 12.6 percent of total variance and 42 percent of residual variance (p=.0067).

Interrelationships

5. *How are stressors, coping styles, and belief systems interrelated?*

Table 11 presents the Pearson Product Moment Correlations of all 18 scales. Scale names are listed below this table. Highlighted correlations are significant at $p < .001$.

Table 11.
Scale correlations.

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1.00																	
2	.50	1.00																
3	.15	.49	1.00															
4	.42	.43	-.01	1.00														
5	.39	**.67**	.50	.47	1.00													
6	-.00	.54	.44	.08	.51	1.00												
7	.07	-.01	-.21	.37	.09	-.14	1.00											
8	.32	.07	.07	.27	.22	.11	.56	1.00										
9	-.04	-.15	-.02	.17	.12	.09	.56	.63	1.00									
10	.28	.36	.45	.49	.49	.16	.26	.43	.45	1.00								
11	.45	.54	.34	.29	.66	.32	.09	.58	.24	.40	1.00							
12	.02	-.03	.04	.36	.26	.17	.34	.57	.59	.45	.22	1.00						
13	.32	.42	-03	.52	.16	.22	.24	.20	-22	.20	.05	.24	1.00					
14	.27	.42	.13	.37	.44	.53	.22	.53	.31	.23	.55	.50	.39	1.00				
15	.21	.32	.03	.51	.40	.42	.46	**.69**	.54	.35	.51	**.69**	.35	**.76**	1.00			
16.	28	.28	.22	.44	.56	.54	.36	**.75**	.65	.46	.60	.65	.21	**.79**	**.81**	1.00		
17	-.30	.07	-.12	.36	.22	.28	.52	.30	.63	.33	.02	.40	.20	.35	.46	.51	1.00	
18	.15	.49	.17	.52	.58	.64	.28	.34	.25	.31	.43	.56	-.50	**.72**	**.76**	**.68**	.47	1.00

Scales:

Stressors		Coping Style		Belief System	
1. Work Changes	4. Relat. Changes	7. Self Care	10. Control	13. Self Esteem	16. Purpose
2. Work Pressure	5. Relat. Press.	8. Active P. Solve	11. Flexib.	14. Optimism	17. Self Express
3. Work Rewards	6. Relat. Rewards	9. Support Seeking	12. Time Man.	15. Power	18. Empathy

Work Pressures were significantly corrrelated with Relational Pressures ($r=.67$, $p < .001$). Respondents who feel that their personal relationships and situations are manageable also feel that their work situations are manageable. Those who perceive their ongoing work-related stressors as draining also feel that their personal lives are distressing.

Power was significantly correlated with Active Problem Solving ($r=.69$, $p< .001$), Time Management ($r=.69$, $p< .001$), and Optimism ($r=.76$, $p< .001$). Crew members who tap into an inner capacity to make things happen and to give and receive what they need also face problems head-on, complete achievable tasks, and reach goals with little distraction. They organize their use of time based on their priorities and demands placed on them. They have the ability to see the bright side of situations and view the future with optimism and hope. Those who feel helpless to meet their needs also avoid coping with problems through procrastination and postponement and lead disorganized, chaotic lives. They view the world with a pessimistic sense of futility and tend to expect the worst.

Purpose was significantly correlated with Active Problem Solving ($r=.75$, $p< .001$), Optimism ($r=.79$, $p<.001$), and Power ($r=.81$, $p< .001$). Respondents who have a strong sense of meaning and relatedness in their lives tend to face problems by actively making decisions and taking actions which are consistent with their goals and values. They view life with optimism and feel that they have the capacity to meet their own needs through their efforts. Those who find little meaning in life and feel detached and alienated tend to avoid completing the tasks that face them. They believe themselves to be helpless and incapable of fulfilling their needs, and they view the world and the future with fatalistic pessimism.

Empathy was significantly correlated with Optimism ($r=.72$, $p< .001$), Power ($r=.76$, $p< .001$), and Purpose ($r=.68$, $p< .001$). Those with the capacity to see others' points of view and recognize others' strengths and limitations also find the good in their own life situations. They believe they have the capacity to make things happen and meet their needs, and they tend to be highly motivated by a sense of purpose, achievement, and meaning. Respondents who harbor resentment, blame, impatience, and anger towards others view the world as gloomy and futile. They feel helpless and find little meaning in life.

Conclusions

The results of this study are not intended to generalize to other units or populations. The purpose of this investigation was to demonstrate the utility of an individualized, unit-specific assessment of aircrew stress, coping styles, beliefs, and symptoms. The outcome of this assessment is meant to be primarily descriptive, however, statistical tests have been carried out to highlight significant relationships between crew members' stressors, how they perceive and cope with them, and what effect they have on their lives.

Stressors

The most problematic causes of stress for the members of this unit were recent changes in the work environment and ongoing work-related pressures. Changes at work can feel challenging and exciting, or stressful and burdensome, but they inevitably require energy and attention. They disrupt the established patterns of interacting and may demand a redefinition of roles and structures. When many changes take place in the span of a year, as with this unit, the necessary adjustments can feel overwhelming and draining. Respondents also indicated an abundance of work pressures (i.e., on-the-job relationships, situations, or issues) that crew members perceive as constraining, difficult, or draining.

On the other hand, the members of this unit indicated that their personal relationships outside the work environment were stable and strong, offering many rewards and satisfactions. These relationships are likely to contribute to crew members' sense of well-being and belonging. Combined with the other results of this assessment, such as the relative paucity of manifest stress symptoms, it would appear that most members of this unit tend to successfully use these relationships to revitalize their spirit and energy in coping with their work-related stresses.

Coping styles

The respondents appear to be most capable of coping with stress through active and flexible problem solving. They face demands head-on, complete achievable tasks, and reach their goals with little distraction. They make decisions and take actions consistent with their priorities and values while maintaining a willingness to experiment with new strategies to solve problems. Hence, they keep pressures in perspective by having a contingency plan to fall back on.

However, the primary hindrance to crew members' ability to cope with stress is their ongoing struggle to control the uncontrollable. This finding is consistent with the literature pertaining to the "aviator personality," which stresses that the need to control one's environment may be beneficial in the cockpit, but disruptive in other areas of life (e.g., Hawkins, 1987). Responses indicate that members of this unit may be relentlessly pushing, demanding, or hurrying even when there is no need to do so. They may be adding to their own stress by being constantly competitive, trying to change others, and setting unrealistic deadlines rather than prioritizing, pacing, and being patient. Perhaps related to this "ceaseless striving," respondents also indicate struggling with effectively managing their time, which contributes to their stress level in a circular manner. Moreover, the crew members report being unwilling to communicate needs or refusing help when it is offered. Thus, although they value the satisfactions inherent in their personal relationships, they fail to tap into these relationships as a potential source of advice and emotional support.

Belief systems

Approximately one-half of the respondents indicated struggling with feeling helpless or powerless to fulfill their own needs. Viewing this in light of their primary sources of stress, this finding may indicate a sense that their work-related changes and pressures are out of their control. They see themselves as victimized and unable to control their stressors sufficiently to be able to cope with them effectively. In addition, they report an unwillingness to share their thoughts and feelings with others, tending to internalize or ignore their emotions and beliefs. This is consistent with descriptions of the "aviator personality" as avoiding potential vulnerability and consistent with the finding that these respondents avoid seeking help from others. This withdrawal may reflect the predominantly male make-up of this unit, but regardless, it denies the members a potentially rich source of support. As Orioli, Jaffe, and Scott (1987) wrote, "The cultural stereotypes of strength and silence as desirable masculine traits, and intuition, expression, and emotionalism as undesirable feminine traits, inhibit both men and women from expressing themselves fully."

Conversely, the crew members' abilities to cope with stress are greatly enhanced by certain commonly held beliefs. Most notably, 71 percent of the respondents scored in the "Strength/ Capability" range on the Optimism scale. This indicates that the majority of the members tend to see the bright side of situations and to view the world with hope. This positive outlook influences behavior, encouraging their active problem solving abilities, and may thus precipitate favorable outcomes that reinforce their expectations in a circular fashion. In addition, the majority of the respondents (67 percent) indicated an attitude of self-respect and positive self-regard. Finally, 62 percent of the respondents reflected a sense of having a purpose or mission in life that adds meaning and a feeling of accomplishment to what they do. The resultant high level of motivation and personal satisfaction is closely related to their relational rewards and optimistic attitudes.

In sum, although the crew members avoid communicating their feelings of helplessness with regard to their work stress, they are motivated by a belief that they will ultimately persevere.

Symptoms

Physical symptoms

A problematic level of physical symptoms such as pain or illness was reported by 24 percent of the respondents. These symptoms are the bodily manifestations of chronic or excessive stress, including back pain, muscle tension, headaches, grinding teeth, and digestive problems, among others. Crew members with these symptoms were most likely to have a more pessimistic outlook on life, tending to view the world as futile and gloomy and to expect the worst. These negative attitudes, such as "Very little in life is fair" may lead to experiences that confirm this belief, which in turn creates more stress and diminishes the crew member's physical coping reserves in a vicious cycle.

The second best predictor of physical symptoms was a lack of work rewards. Feeling valued for our talents and abilities on the job contributes to our level of work satisfaction and bring enjoyment and challenge to our daily work experience. In the absence of this sense of being valued and appreciated in the work environment, crew members are likely to view work as a source of frustration, and it is these members who experience symptoms of physical burnout.

Behavioral symptoms

The absence of work rewards was also most predictive of behavioral symptoms. Behavioral symptoms consist of self-defeating ways in which we seek to relieve stress, such as smoking, drug abuse, overeating, and alcohol. Perceiving the work environment as unappreciative of one's efforts or talents is the most likely factor (of all those measured in this unit) to precipitate the development of these self-defeating stress reactions.

The other most significant predictor of behavioral symptoms was a low score on the Empathy scale. Respondents who harbor resentment and anger towards others, themselves, or their circumstances to the point of bitterness or hostility tend to resort to quick-fix stress relievers that are ultimately self-defeating. The Empathy construct contains many of the factors typically associated with "Type A" personality style, with low scorers demonstrating perfectionistic expectations, blaming, and impatience. These factors are typically thought of as precipitating health problems, but with this sample, they were more associated with the behavioral symptoms that may ultimately lead to health problems.

Emotional symptoms

A lack of empathy was also predictive of emotional symptoms. Emotional symptoms include subjective reactions to stress such as irritability, anxiety, fatigue, and depression. Doubts, fears, and worries result from focusing on inadequacies and rehashing mistakes, and in this sample they were associated with resentment towards oneself and others. In sum, those respondents who set unreasonable expectations for themselves and others and resent that these expectations are not met ultimately feel anxious, depressed, and angry.

Emotional symptoms were also predicted by an excessive degree of relationship pressures. These pressures include marital conflicts, household tasks, time issues, and financial worries. When crew members perceive their ongoing personal relationships as draining or conflictual, they tend to feel anxious, worried, and depressed.

Recommendations

This study demonstrated that the stress assessment device employed is useful in elucidating a unit's strengths and weaknesses in terms of sources of stress, coping skills, and belief systems. In addition, the assessment examines three areas of stress symptoms for potential problems

which might ultimately effect a unit's operational effectiveness. Finally, it provides a quantitative data base enabling members to explore relationships between their sources of stress, coping styles, and common belief systems, and the development of stress-related symptoms.

These unit-specific data may be used to suggest organizational changes. For example, members of the medical evacuation unit assessed in the current study percieved excessive work changes and work pressures as the significant sources of stress in their lives. This might suggest to the command the following potential methods of alleviating crew stress:

* Schedule periods of rest and renewal. Transitions require physical and emotional energy, which can be replenished in relatively unobtrusive ways, such as brief time away from the desk and daily stretching. A crew rest management program should be implemented and strictly adhered to, affording members a quiet environment in which to sleep.

* Alleviate some ongoing stressors. Start by having members identify the work pressures they perceive as most stressful. Some may resent their work as boring and unrewarding, while others may be stressed by conflicts, job expectations, or performance reviews. Examine the identified areas to find any parts of the pressures that can be changed. For example, can crew members be given more input, freedom, or flexibility?

Another problem area for this unit was found to be the adoption of a coping style that emphasizes active, flexible problem solving, but espouses an endless striving to control the uncontrollable and a refusal of help from others. A stress intervention might benefit this unit by teaching crew members to:

* Recognize "ceaseless striving" responses. Crew members can learn to identify the emotional signals (anger, hostility) and physical symptoms (tight muscles, clenched teeth) that indicate impatience and unrealistic expectations.

* Identify aspects of situations that can be controlled. Crew members can explore ways of planning for frustrating situations, managing time optimally, setting realistic goals, and asking for help when needed.

This unit was also found to be negatively affected by belief systems reflecting powerlessness and helplessness and by an internalization of thoughts and feelings. Recall that the results of this assessment indicated significant correlations between power and active problem solving, time management, and optimism. Therefore, this area is potentially problematic for this unit because those members who feel powerless also tend to avoid coping with problems, fail to manage their time effectively, and view the world with a sense of pessimism. These problematic beliefs are closely related to the control issue just discussed. These crew members might be encouraged to:

* Take control of the controllable. By taking action to change aspects of situations that are within their control, the crew members will build their sense of power over their

environment. For example, being involved in an intense medical evacuation unit may seem unavoidably stressful by nature. However, members can help manage their individual stress levels by maintaining good health practices and rest, avoiding alcohol, getting involved in family-oriented recreational activities, communicating needs and grievances, etc.

* Find methods of self expression. It's important for crew members to find some way to express their thoughts and feelings because self-disclosure is the only way to let people know exactly what one wants. Crew members can be taught to communicate in effective, direct ways which minimize their fear of vulnerability.

These problem areas can be presented to command and/or to the unit as a whole in a simple pictorial format which may be labeled the unit's "Stress Profile" (see appendix B). This profile emphasizes both the significant strengths and weaknesses of the unit in terms of stress causes, coping, and beliefs, as well as the magnitude of the strength or weakness.

The assessment also allows a depiction of predictors of each type of stress symptom (see appendix C). This figure may be labeled the unit's "Symptom Model" in that it describes pictorially the relationships between causes, coping styles, and/or belief systems to the three types of stress symptoms. For this particular unit, a lack of work rewards and relational pressures were the causes significantly predictive of symptoms, and pessimism and resentment were the belief systems related to the development of symptoms.

Presented with this model, command may select a particular symptom type as a target of intervention. For example, if command of this unit were particularly concerned about the effects of behavioral symptoms (such as drinking alcohol) on operational readiness, they might focus on making administrative changes to increase work rewards and instituting seminars designed to teach effective modulation of feelings of resentment and anger.

This study served to establish the viability and utility of this assessment device for military aviation units. The individualized results suggest the potential for directing intervention measures to the specific areas in need of attention to manage the stress of members of a particular unit. Yet to be undertaken are outcome studies demonstrating the ultimate ability of the assessment and ensuing intervention efforts toward reducing the stress levels and improving the coping skills of respondents.

In addition, using this assessment with various units with differing missions might reveal certain commonalities and patterns, potentially precipitating the development of standard mission-oriented stress management programs. For example, future administrations may reveal that medical evacuation units tend to have a need for control-oriented seminars and incentive programs increasing work rewards. This finding could guide the development of a Medical Evacuation Stress Management Program. Whereas engineering units may typically require relationship/communication training to reduce personal pressures, for example. This information

would then be used to guide the development of an Engineering Unit Stress Management Program, and so on.

In this way, stress management interventions would be mission-relevant. This could theoretically help to reduce resistances and increase the direct relevance of efforts to operational readiness. The present study constitutes the initial step in this direction.

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Appendix A.

Stress questionnaire.

Stress Questionnaire

This assessment should take about 35-40 minutes to complete.

It will provide information about your environment, coping responses, inner world (thoughts and feelings), and symptoms of distress. In a sense, it will provide a "snapshot" of the state of your stress level at this time. This will be invaluable in designing your unit's stress management program.

Complete each scale by circling the number (3,2,1,or 0) in the column that best describes your response to each statement. Note that you will be asked to think about either *last month* or *last year* for each scale. If you are uncertain as to when something occurred, use your best guess.

Answer each question as best you can. Don't leave any question unanswered. Work quickly and stick to your initial response. Try to be as honest as possible. If you have trouble answering a question, think of how a friend or co-worker might rate you on that item.

Remember, there are no right or wrong answers.

Thank you.

Stress Questionnaire

Think about the past **year**. *For each of the changes listed below, indicate how much or how little each has been a source of stress to you.*

	Great	Moderate	Little	None/Didn't Occur
New job or employer	3	2	1	0
New type of work	3	2	1	0
Change in work location or conditions	3	2	1	0
Change in responsibilities (promotion, demotion, or transfer)	3	2	1	0
Fired, laid off, quit, or retired	3	2	1	0
Passed over for promotion	3	2	1	0
Change in expectations, supervisors, or job role	3	2	1	0
New technologies or new commander	3	2	1	0
Major new or special project or responsibility	3	2	1	0
Change in residence	3	2	1	0
Death of a close family member or friend	3	2	1	0
Crisis with friend/family member (drug problem, job loss)	3	2	1	0
Separation or divorce of family member	3	2	1	0
A new close relationship	3	2	1	0
Your separation or divorce	3	2	1	0
Home improvement or repair	3	2	1	0
Illness or injury keeping you at home for a week or more	3	2	1	0
Change in family activities	3	2	1	0
New family member (birth, adoption)	3	2	1	0
Serious illness in family	3	2	1	0
Financial loss or diminished income	3	2	1	0
Major personal achievement	3	2	1	0
A major purchase or new debt	3	2	1	0
A "falling out" in family or friendship	3	2	1	0
Involvement in legal system	3	2	1	0
Property loss, theft, damage, or accident	3	2	1	0
Crime victim	3	2	1	0

Think about the past **month.** *For each of the pressures listed below, indicate how much each has been a source of stress to you.*

	Great	Moderate	Little	None
Workplace is bleak, uncomfortable, or depressing	3	2	1	0
Physically difficult or hazardous work conditions	3	2	1	0
Difficult or long commute	3	2	1	0
Too many job tasks and responsibilities	3	2	1	0
Boring routine tasks	3	2	1	0
Confused or unclear expectations	3	2	1	0
Conflicting or competing demands	3	2	1	0
No clear opportunities for promotion	3	2	1	0
Can't get the resources (information, help) I need	3	2	1	0
Deadline pressures	3	2	1	0
Many organizational or job task changes	3	2	1	0
No input on decisions affecting my work	3	2	1	0
Responsibility for others	3	2	1	0
No recognition for work well done	3	2	1	0
Too many people telling me what to do	3	2	1	0
Office politics	3	2	1	0
Not sure where I stand with my supervisor/rater	3	2	1	0
Don't like my job	3	2	1	0
Job doesn't use my skills and abilities	3	2	1	0
No room for creativity or personal input	3	2	1	0
Ethical problems with my work	3	2	1	0
Have not gotten what I expected/wanted from my job	3	2	1	0
Loss of commitment or dedication to work	3	2	1	0
Inadequate salary	3	2	1	0
Conflict with co-workers or supervisor	3	2	1	0
Procedures are unfair or discriminatory	3	2	1	0
Too much or too little contact with people	3	2	1	0
Not enough money	3	2	1	0
Heavy debts	3	2	1	0
Conflicts with mate	3	2	1	0
Conflict over household tasks	3	2	1	0
Problems with children/housemate	3	2	1	0
Pressures from in-laws, family	3	2	1	0
Not enough time with family/friends	3	2	1	0
Work-family conflict	3	2	1	0
Sexual conflict or frustration	3	2	1	0
Dangerous or stressful neighborhood	3	2	1	0
Few friends in neighborhood	3	2	1	0
Time pressures with mate	3	2	1	0

Think about the past **month.** *For each of the satisfactions listed below, indicate how true each is for you.*

	Very	Somewhat	Little	Not at all
I enjoy my job	3	2	1	0
I like what my unit stands for	3	2	1	0
I have good relationships with people	3	2	1	0
I have a supervisor whom I like and trust	3	2	1	0
I have a good physical working environment	3	2	1	0
I receive adequate compensation for my work	3	2	1	0
I am able to get the information I need to do my job	3	2	1	0
I feel liked and valued by the people at work	3	2	1	0
My work offers me the opportunity for advancement and growth	3	2	1	0
I receive feedback about the quality of my work	3	2	1	0
I use my abilities and talent on the job	3	2	1	0
The commute to my job is easy	3	2	1	0
The hours of work are convenient to my needs	3	2	1	0
I participate in decisions about things at work that affect me	3	2	1	0
I am respected by others in the community for my job	3	2	1	0
I feel accepted and loved by my friends/family	3	2	1	0
The people around me take time for me when I need it	3	2	1	0
Those closest to me undertsand when I am upset and respond to me	3	2	1	0
The people close to me support me to do new things and make changes in my life	3	2	1	0
My mate accepts my sexuality	3	2	1	0
Those closest to me express caring and affection to me	3	2	1	0
I spend high-quality time with friends/family	3	2	1	0
I feel close and in touch with friends/family	3	2	1	0
I am able to give what I would like to my friends/family	3	2	1	0
I know that I am important to the people closest to me	3	2	1	0
I am honest with the people close to me and they are honest with me	3	2	1	0
I can ask for help from my family and friends when I need it	3	2	1	0
I can usually find people to "hang out" with	3	2	1	0
I know that others are there for me	3	2	1	0

Think about the past **month**. *For each statement, indicate how often or to what degree it describes your behavior.*

	Almost Always	Sometimes	Rarely	Never
Eat breakfast	3	2	1	0
Maintain desirable weight	3	2	1	0
Avoid sugar	3	2	1	0
Avoid fat	3	2	1	0
Do vigorous aerobic exercise	3	2	1	0
Do stretching or yoga	3	2	1	0
Aware of tension in my body when it occurs	3	2	1	0
Brush teeth	3	2	1	0
Fasten seat belts in cars	3	2	1	0
Have a physician I trust who knows me well	3	2	1	0
Would seek help for an emotional or health problem	3	2	1	0
Relax and take time off	3	2	1	0
Avoid smoking	3	2	1	0
Avoid excessive alcohol use	3	2	1	0
I finish what I set out to do	3	2	1	0
I deal with things soon after they come up	3	2	1	0
I find it hard to anticipate difficulties	3	2	1	0
I do as good a job as I can under the circumstances	3	2	1	0
I avoid challenges and new situations	3	2	1	0
I am cautious and shy away from new tasks	3	2	1	0
I work to satisfy myself more than others	3	2	1	0
I anticipate and plan ahead to meet challenges	3	2	1	0
I find it hard to get involved in what I am doing	3	2	1	0
I know how to say "no"	3	2	1	0
I negotiate so that some tasks are more manageable	3	2	1	0
I do minor tasks to avoid doing major ones	3	2	1	0
When things are difficult I get tired or lose concentration.	3	2	1	0
I find someone to work on projects with me	3	2	1	0
I seek information I need from others	3	2	1	0
I try to find someone who can handle a difficult situation.	3	2	1	0
I talk over difficult situations with someone I trust	3	2	1	0
I seek advice and support from others	3	2	1	0
I am willing to talk about problems with a doctor or counselor	3	2	1	0
I let people know about uncomfortable feelings that are getting in the way of our work	3	2	1	0
I let people know when a task is too much or I'm too busy.	3	2	1	0

	Almost Always	Sometimes	Rarely	Never
I am able to take time for myself	3	2	1	0
I find it hard to make time for personal errands	3	2	1	0
I eat rapidly and finish meals before other people	3	2	1	0
I get impatient when someone is doing a job that I could do quicker	3	2	1	0
I find time for hobbies or outside interests	3	2	1	0
I hurry even when I have plenty of time	3	2	1	0
I set unrealistic deadlines for myself	3	2	1	0
I push to finish a task, even when I am tired	3	2	1	0
I am hard-driving and competitive	3	2	1	0
Other people set standards for me	3	2	1	0
I'd rather do things myself than get help	3	2	1	0
I find it hard to wait	3	2	1	0
I put other people before myself	3	2	1	0
I get great satisfaction from my accomplishments	3	2	1	0
I decide certain problems are not worth worrying about	3	2	1	0
I relax myself when tension builds up	3	2	1	0
I can see the humorous side of situation	3	2	1	0
I often put things aside for awhile to get perspective on them	3	2	1	0
I reward myself when I finish a job	3	2	1	0
I put pressures in their place and do not let them overwhelm me	3	2	1	0
I make several alternate plans to deal with situations	3	2	1	0
When I face a problem, I try to get a clear focus on what I could do about it	3	2	1	0
I use my time efficiently	3	2	1	0
I avoid doing important things	3	2	1	0
I find it difficult to complete things	3	2	1	0
Distractions keep me from doing what I want	3	2	1	0
People tend to dump tasks on me, and I accept them	3	2	1	0
I know what I want to be doing	3	2	1	0
I miss appointments or forget important things	3	2	1	0
I move from task to task with no reason	3	2	1	0
There is time to accomplish what I expect to do	3	2	1	0
I do more than I have to on tasks, rather than get on to other things	3	2	1	0
I'm so busy helping others, I don't get my own work done	3	2	1	0

Think about the past **month.** *For each of the following statements, indicate how much each represents the way you think or feel about yourself or the world.*

	Very much	Somewhat	Not very much	Not at all
I minimize my abilities	3	2	1	0
I wish I were another person	3	2	1	0
I make demands on myself I wouldn't make on others	3	2	1	0
I expect others to fault my work	3	2	1	0
I blame myself when things do not work out the way I expect	3	2	1	0
When I succeed I do not think I deserve it	3	2	1	0
I like who I am	3	2	1	0
Under pressure, I think of the ways things can go wrong	3	2	1	0
Other people rarely "come through" for me	3	2	1	0
I usually hope for the best	3	2	1	0
I find it hard to look on the bright side of things	3	2	1	0
I am a naturally positive person	3	2	1	0
I have been continually frustrated in my life because of bad breaks	3	2	1	0
The future will probably be better than things are now	3	2	1	0
I seem to get the short end of the stick	3	2	1	0
Very little in life is fair or equitable	3	2	1	0
When things are not going my way, I think it's uesless to try to change them	3	2	1	0
My stress seems to be unpredictable	3	2	1	0
I find ways to accomplish what I want	3	2	1	0
I am not able to give what I want to people close to me	3	2	1	0
I find myself in situations I feel helpless to do anything about	3	2	1	0
I run into problems I cannot solve	3	2	1	0
I do not think I have control over things in my life	3	2	1	0
I like to take on new challenges	3	2	1	0
I keep my feelings to myself	3	2	1	0
I let others know when I am under pressure	3	2	1	0
I do not like to let people know that I disagree with them.	3	2	1	0
When I am upset, I avoid other people and go off alone	3	2	1	0
I hold in my anger and frustration	3	2	1	0
I feel much better when I talk about my feelings	3	2	1	0
I am afraid of losing control of my feelings	3	2	1	0
I let others know when I'm angry or disappointed with them	3	2	1	0

	Very much	Somewhat	Not very much	Not at all
When I am upset, I blame someone else for things	3	2	1	0
I accept other people's differences	3	2	1	0
I blow up with little warning	3	2	1	0
I feel jealous of others' success	3	2	1	0
I easily become nasty or irritable	3	2	1	0
When I feel pressured or frustrated, I fall apart emotionally and lose control	3	2	1	0
I never know what I will say when I feel angry	3	2	1	0
I make allowances for other people's limitation	3	2	1	0
I can put myself in other people's shoes	3	2	1	0

Think about the past **month.** *For each of the symptoms listed, indicate how often it has occurred for you.*

	Nearly Every Day	Every Week	Once or Twice	Never
Muscle tension	3	2	1	0
Back pain	3	2	1	0
Headache	3	2	1	0
Grinding teeth	3	2	1	0
Stomach ache or upset	3	2	1	0
Heartburn	3	2	1	0
Diarrhea	3	2	1	0
Constipation	3	2	1	0
Abdominal pain	3	2	1	0
Cold or hay fever	3	2	1	0
Chest pain	3	2	1	0
Shortness of breath	3	2	1	0
Skin rash	3	2	1	0
Dry mouth or sore throat	3	2	1	0
Laryngitis	3	2	1	0
Loss of appetite	3	2	1	0
Overeating	3	2	1	0
No time to eat	3	2	1	0
Smoking	3	2	1	0
Drinking alcoholic beverages	3	2	1	0
Taking tranquilizers	3	2	1	0
Taking aspirin and other pain relievers	3	2	1	0
Taking other drugs	3	2	1	0
Withdrawing from close relationships	3	2	1	0
Criticizing, blaming, or ridiculing others	3	2	1	0
Feeling victimized or taken advantage of	3	2	1	0
Watching TV (over 2 hours a day)	3	2	1	0
Overwhelmed by work	3	2	1	0

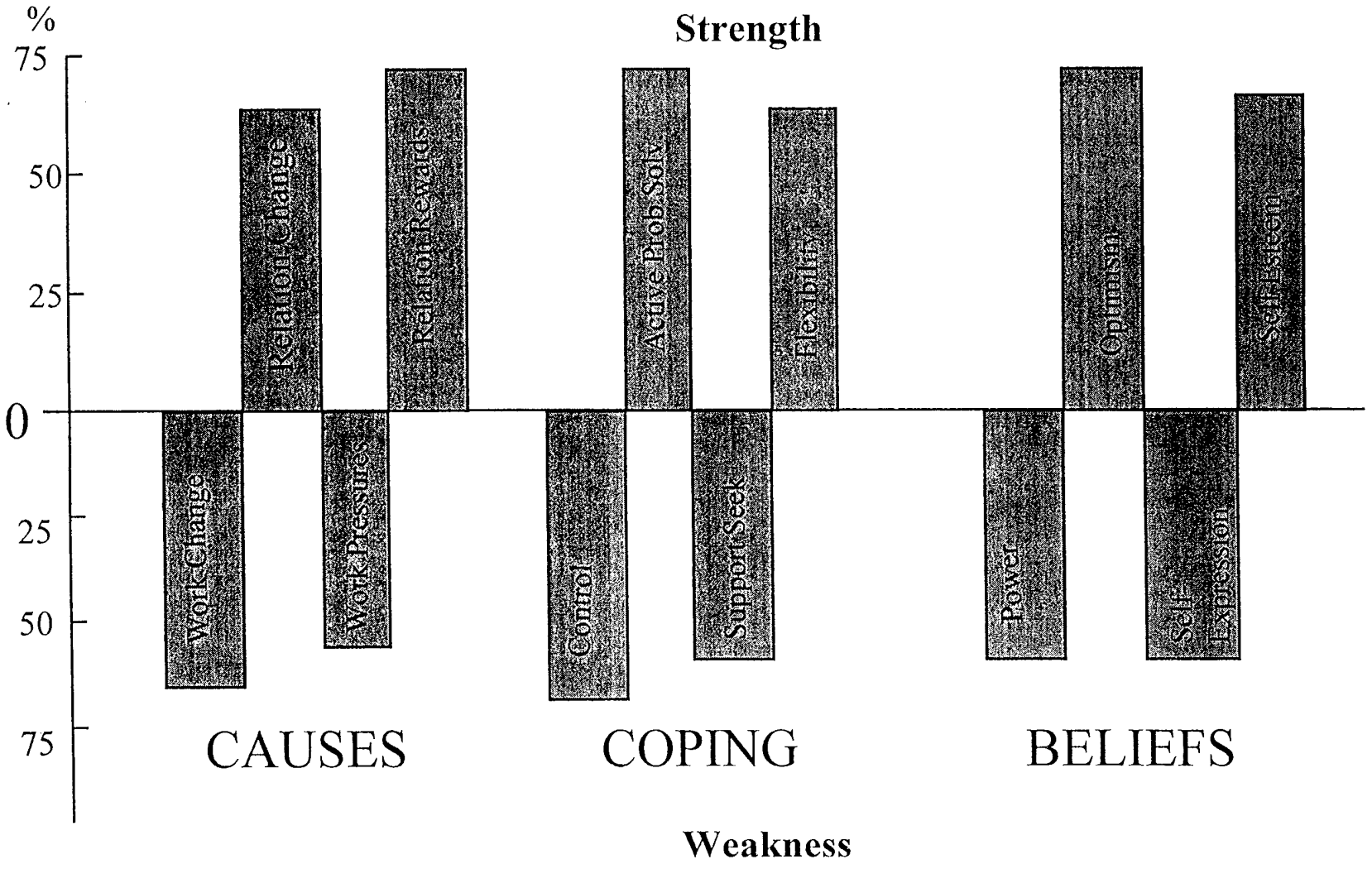
	Nearly Every Day	Every Week	Once or Twice	Never
Difficulty meeting commitments or completing tasks.....	3	2	1	0
Resent people I encounter at work.....	3	2	1	0
Hard to pay attention to work tasks.....	3	2	1	0
Accidents or injuries.....	3	2	1	0
Distant and uninvolved at work.....	3	2	1	0
Nervousness or anxiety.....	3	2	1	0
Tremor or trembling.....	3	2	1	0
Twitch or tic.....	3	2	1	0
Keyed-up feeling.....	3	2	1	0
Cannot turn off certain thoughts.....	3	2	1	0
Worrying.....	3	2	1	0
Unable to keep still, fidgeting.....	3	2	1	0
Irritable; angry emotional outbursts.....	3	2	1	0
Fatigue.....	3	2	1	0
Low energy.....	3	2	1	0
Apathetic; nothing seems important.....	3	2	1	0
Emotionally drained.....	3	2	1	0
Loss of sexual interest or pleasure.....	3	2	1	0
Depressed.....	3	2	1	0
Fearful.....	3	2	1	0
Hopeless.....	3	2	1	0
Crying easily.....	3	2	1	0
Insomnia.....	3	2	1	0
Difficulty awakening.....	3	2	1	0
Too much sleep (over 9 hours).....	3	2	1	0
Difficulty concentrating.....	3	2	1	0
Mind going blank.....	3	2	1	0
Forgetting important things.....	3	2	1	0

Appendix B.

Stress profile.

Unit Stress Profile

Strengths and Weaknesses



Appendix C.

Unit symptom model.

Unit Symptom Model

Relationship of Causes and Belief Systems to Symptom Types