



Dealing with Stress in the Aircraft Cabin

What exactly is stress, and under what situations may it influence flight attendants and passengers in the normal aviation environment?

by

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This discussion concerns stress in relation to the human occupants of the aircraft cabin, and not with the connotation of stress which engineers talk about in relation to mechanical structures. These concepts, however, are not so very different. In each, there is the concept of forces being exerted and giving rise to effects which, beyond certain levels, may lead to damage or even destruction. The engineer terms the casual force "stress" and the resulting effect "strain."

There is less precision in the language describing human experience where the word stress is used indiscriminately to refer both to the events in the environment and to the reaction of the individual to these events. We talk of the stress of long hours of work (where stress is a stimulus) and the stress of disturbed sleep (where stress is a response). In this discussion, the words stress and stressor refer to the external events and stress response describes the effects of these events upon the individual.

There is a tendency to consider stress negatively, as something to be eliminated from our lives. This is a consequence of considering only the effects of excessive stress, manifested in such unwelcome feelings as a churning stomach, sweating palms, disturbed sleep, and intrusive and upsetting thoughts. However, conceived of as a spur to action, as a stimulus, then some measure of stress is essential to arouse us from apathy. A life without stress, in the sense of challenge, would be akin to living the life of a cabbage.

Stress, then, can be regarded as a stimulus by which we are aroused from a vegetative existence to one of activity. At any given moment, our level of arousal is at a point on a continuum extending from a state of sleep, through apathy to wakefulness, alertness and finally, panic. Thus, if our level of arousal is low, a stressor will act to raise it; for example, when we are sleepy, a loud noise will wake us. If our level of arousal is already high, then the stressor will act to raise it further; for example, when we are tense and nervous, a loud noise is more likely to startle us, disrupt our performance and make us more tense and nervous.

Arousal, Stress and Task Performance Affect Us

An optimum level of arousal is required to ensure that we perform a given task smoothly and competently. If the level of arousal is less than the required level, an inadequate, lackluster performance will result. In such a case, the addition of a stressor will serve to increase arousal and thus enhance performance. However, the addition of a stressor to an already optimum level of arousal may result in the disintegration of skills and a degradation of performance.

The level of arousal that is best for a given task is related to the complexity of that task. The optimal performance of a simple task requires a higher level of arousal than

does a more complex task; this is because the inherent tedium of simple tasks demands an added component to arouse us. Complex tasks, on the other hand, are sufficiently demanding in themselves, and the addition of a stressor is thus likely to disrupt them.

Investigating Sources of Stress

The physical environment is potentially a major source of stress. Included here are the extremes of heat and cold, loud noise, humidity, inadequate illumination and glare, pollutants and airborne infections in the atmosphere. Some of these stressors can be found in the aircraft cabin.

Aspects of a particular occupation can be stressful. These include long working hours; working patterns that disrupt circadian rhythms; excessive work load and its opposite, insufficient work load; repetitive work; lack of control over aspects of the work situation; social isolation; and the use of tools and equipment that are badly designed, which increases fatigue and may also precipitate ill-health. The lack of an occupation, i.e., unemployment, can also be a major source of stress.

The social and organizational aspects of employment have been recognized as powerful factors in contributing to stress in the environment. The need to satisfy the conflicting, and incompatible, demands of other people is a serious problem in some occupations. There may be insufficient information available to people about the jobs they are supposed to be doing, so that they do not know whether they are performing adequately or not. They may be expected to do greater amounts of work than they are able; or they may be expected to produce higher quality work than they are capable of producing. Lack of appreciation, both in monetary and other manifestations, is also a source of stress.

Beyond occupational stressors are the “life events” such as marriage, divorce, retirement or any other event that brings about a major change in the individual’s life pattern. An accumulation of these events within a limited period of time has been shown to be associated with the onset of illness that can include heart attacks and ulcers. Life events have been ranked in order of the demands they make upon the individual for readjustment to the new situation. Heading this list is the death of a spouse, which calls for the most readjustment, followed by divorce and marital separation. Not all the life events have an obvious negative connotation. For example, included on the list are outstanding personal achievement, gain of

a new family member, vacations and Christmas. The significance of all these events is that they demand readjustment to a new situation.

There are also events not typically part of normal living which constitute major sources of stress. These include involvement in war, in natural disasters such as earthquakes and floods, and in serious transport accidents such as aircraft crashes. These traumatic events can have effects upon the people involved in them that sometimes extend through a period of years.

Examining the General Adaptation Syndrome

The effects of stress are partly specific to the particular stressor (extreme cold will produce shivering, extreme heat will produce sweating) and are partly general “stress” effects. These general effects, common in response to all stressors, serve the purpose of defending the individual against the dangers of the stressor. If this defensive reaction is required to persist because of the individual’s continued exposure to the stressor, then it will progress through three distinct stages — alarm, resistance and exhaustion. These stages constitute the General Adaptation Syndrome as described in *The Stress of Life* (1956) by the Canadian physiologist Hans Selye. During the first state, that of alarm, the body responds to the stressor but at the cost of a reduction in the level of resistance. Death can result if the stressor is extreme and resistance is completely overcome. An example is death from exposure to extreme cold.

The second stage is resistance, when the individual adapts to continued exposure to the stressor. This adaptation is apparent in bodily changes and is associated with disease states. Ultimately, the third stage of exhaustion is reached when the resources needed for continued adaptation fail and the individual dies.

The important message to be derived from the general adaptation syndrome is that of the costs of adapting to noxious environments. It is possible to burn the candle at both ends for a long time, but this wear-and-tear has a price tag, and eventually payment must be made.

Fight, Flight or Freeze

In the state of alarm, the body is made ready for action, i.e., fight or flight. Heart rate increases in order to supply more blood to the brain and musculature; blood is

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diverted from the stomach and digestion ceases; breathing rate is increased; the mouth becomes dry; sweat rate is increased; muscles tense; hair stands on end; and eyes dilate. All these changes are associated with the activity of the autonomic nervous system and of the pituitary gland which releases a hormone into the blood stream. This, in turn, stimulates the adrenal gland to secrete adrenalin.

A third possible reaction, as an alternative to fight or flight, is to freeze. This involves the suppression of behavior and a state of total immobility. In the animal world, this response is adaptive in avoiding the attentions of a predator.

Survival may depend upon the capacity to fight, flee or freeze. The ability to escape from the path of an oncoming car or to defend oneself against the attack of a mugger rely upon the availability of all the resources of the body. However, we no longer live in caves and do not usually require the great reserves of muscular energy which the response to threat makes available; thus, the preparations for physical action are not normally utilized. They nonetheless contribute to wear-and-tear on the body. The development of stomach ulcers, for example, has been associated with the frequency of instances when blood flow is diverted away from the stomach as digestion is halted following the release of adrenalin.

Anxiety and Stress Play their Parts

Although stressors such as loud noises or extremes of temperature have an effect upon the body, they are not normally considered to be threatening in the same way as an encounter with a hungry tiger. Threat implies some personal danger and evokes a complex response involving feelings of apprehension, worry, fear and anxiety. A high level of threat may result in behavior that is excessively agitated and excited or it may be rigid and frozen. The bodily responses associated with the activation of the general adaptation syndrome are experienced as the unpleasant concomitants of fear — nausea, feelings of extremes of heat or cold, tremor, tension or an urge to escape.

Should a person encounter a hungry tiger, it is very likely that, even after a successful escape, the place where this happened will have very negative associations for that person. Because of this, just the thought of a return visit to that place will evoke fear, even in the absence of the tiger. This fear will gradually subside if subsequent visits are made and the site is determined to be no longer dangerous. In this way, associations are gradually formed between the place and feelings of safety. If, however, the

individual refuses to return after the first fearful experience, then there is no possibility that positive association can develop and the place will continue to be a source of fear.

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The threats to civilized life do not usually include hungry tigers. They are more likely to involve rejection by a loved one, the loss of the esteem of others and the possibility of unemployment with all the deprivations that this would entail. These threats derive their power from their association with pain and fear developed during the course of living. In response to these threats, we develop coping mechanisms. These are adaptive when they remove the threat; they may be maladaptive when they involve avoiding or denying the threat.

Because the experience of anxiety is so unpleasant, people are highly motivated to eliminate or to avoid it. When a threat evokes overwhelming anxiety, defense mechanisms come into play. The fear may be repressed, pushed out of conscious awareness; it may be displaced to a more acceptable target; some socially acceptable reason may be given to justify it; or, the person may regress to earlier behavior patterns. While these defense mechanisms may appear to solve the immediate problem of coping with anxiety, they have the effect of perpetuating it, and thus create additional problems of coping.

Individual Differences Arise in Response to Stress

People respond in different ways to what appears to be the same stressor. For example, while some people may be reduced to blubbling by just the thought of flying, and others look forward to a flight with pleasurable excitement, and others regard the prospect as the greatest bore.

The explanation of these different reactions can be found in the different meanings these events have for different people. The central notion is that the individual is not a passive recipient of events in the environment, but is actively involved in reacting to them. Thus, it is our interpretation of a situation which is the key to the way we will respond to it.

This can be illustrated by a person taking an important written examination who notices that, during the past half hour, many people leave the room early. The person, who has not yet finished, can interpret these events in different ways. All those who left early may be seen as

highly competent because they have been able to complete the test well within the time allowed, or they may be seen to have left early because they have exhausted their limited supply of knowledge and are thus not competent. The first interpretation is likely to be associated with feelings of panic and inadequacy, leading to blocking and possible failure.

Cabin Occupants Affected Differently

The two groups of occupants in the aircraft cabin, the cabin crew and the passengers, are affected by stress. There are some important differences, however, in terms of the exposure of each group to the stressors in the cabin and in their responses to the stressful situations. We shall therefore consider each group separately.

	Normal Flight	Emergency Situation	After the Emergency
Passengers	A	C	E
Cabin Crew	B	D	F

Examples of possible reactions of passengers and cabin crew

- A — fear, tense muscles, ear ache
- B — fatigue, sore throat, muscle strain
- C — freezing, panic
- D — change of role, high arousal
- E — grief, depression
- F — guilt feelings, self-reproach

Table 1. Stress and Flight

Table 1 summarizes the potentially stressful situation in flight for each group, passengers and cabin crew, together with some of the possible reactions.

Some passengers may find normal flight stressful. For example, they may be anxious about flying or they may have bodily responses to pressure changes which are painful or uncomfortable.

During a normal flight, the cabin crew is exposed to some degree of stress. This may arise from a variety of sources, e.g., disturbances of circadian rhythms; poor design of galley equipment; problems of interpersonal relationships with passengers or other crew members; or requirements to complete a large number of tasks within a short time period.

Emergency Situations Boost Stress Levels

In emergency situations, both groups of cabin occupants are subjected to high stress levels. The major difference between the two groups is that the crew is trained to cope with these situations and the passengers are usually unprepared. This leads to different ways to reacting to the stress. This topic was addressed by the author in “Stress, Behavior, Training and Safety,” (May/June 1990 *Cabin Crew Safety*) where the relation between the ability to cope successfully with the stress of an emergency and the level of training and preparation was discussed.

After the Emergency — Post Traumatic Stress Disorder

There is a third situation in which stress responses play a major role, and that is after a traumatic incident such as a serious aircraft accident when survivors may suffer from post traumatic stress disorder (PTSD). This condition is characterized by long-term persistent “re-living” of the trauma which may make it impossible for the sufferer to readjust to normal patterns of living. Disturbance of appetite and sleep schedules frequently occur together with headaches, depression and loss of concentration. Compared with passengers, members of the cabin crew may, because of their professional involvement in the incident, be exposed to more intense feelings of guilt, for instance.

Cabin Pressure Is a Stressor

Cabin pressure at cruising altitude, while remaining within safe limits, is lower than pressure at ground level — which equates to a higher cabin altitude than would be experienced at sea level. Further increases in cabin pressure to lower the cabin altitude closer to the surface pressure would be prohibitively expensive to achieve. For most passengers, cabin pressure poses no problem. However, some may suffer pain and discomfort during flight.

One consequence of reduced cabin pressure is that the air in the body cavities increases in volume. Painful sensations in the ears during ascent and descent are due to the increased volume of air in the middle ear which escapes through the eustachian tube connecting the ear to the throat. These painful sensations are increased if this passage is blocked because of mucous or other symptoms of colds. Similarly, the expansion of air in tooth cavities can cause toothaches. While expanded air in the large intestine is able to escape, the air within the small intestine is trapped and can cause abdominal pain which may be quite intense.

Another effect caused by the reduced pressure is that there is less oxygen available per breath taken. Oxygen is essential for life and has a swift effect on brain function. The reduction in available oxygen can affect elderly passengers in particular, and they may exhibit signs of confusion and personality change. Reduced oxygen may also cause some individuals to compensate by increased respiration and by hyperventilation. Supplementary oxygen is required in these circumstances.

The quality of the air in the cabin is different from that on the ground. Perhaps the most noticeable aspect for passengers is the severe reduction in moisture content of cabin air that causes irritation of the eyes and throat, which leads eventually to dehydration if insufficient liquid is taken.

Fear of Flying Has Many Variables

For some people, the prospect of a journey by air is so threatening that they feel unable even to contemplate flying and refuse to do so under any circumstances. A less extreme reaction is to fly only because a personal situation, such as a family bereavement or a business obligation, demands it, and where the fear of flying is outweighed by these other considerations. Some passengers always feel a little apprehensive, before and during a flight; others will find that their anxiety dissipates as soon as the flight has begun. Yet, others regard flying as an unremarkable aspect of their lives, while some people experience pleasurable excitement both at the prospect of flying and during the flight itself. Thus, the range of reactions to flying is an extremely wide one.

The people whose fear is so great that they would never agree to fly are obviously of no concern to the flight attendant. They are of concern to the airlines, however, because they represent a market sector yet to be tapped. Those whose anxiety is excessive, but who nevertheless feel for some reason that they must travel by air, may become so terrified once on board that they are unable to tolerate the situation and demand to be allowed to disembark. If this terror becomes overwhelming when the aircraft is airborne, the passenger may present a serious problem, both in trying to pacify the individual and in avoiding the spread of alarm to others. It has not been unknown for an aircraft to turn back to deplane a severely anxious passenger.

It is not a simple matter to determine the extent of fear of

flying. Information about this topic is based upon the answers people give to questions about their feelings, and one problem is to find words which have the same meaning for all respondents. Words like "fear" and "anxiety" may not have equal significance for all. Furthermore, it may be difficult for some of those questioned to admit to feelings of fear. This is a possible explanation for the finding that about half as many men as women express fear of flying; it may not be considered compatible with a "macho" image. Thus the extent of the problem is likely to be underestimated.

Estimates of the extent of fear of flying among the general population suggest that one-third have some degree of fear, while among those who fly the proportion is a quarter. About 10 percent of the population will not fly because of fear.

Fearful Flyers Develop Strategies to Cope

Different strategies are adopted by fearful passengers in order to cope with the stress of flying. Some of these are short-term and only partly effective. A frequently-used palliative for anxiety is alcohol, taken in sufficient quantities to numb the senses. Tranquilizing drugs are also used to reduce anxiety. Sometimes a cocktail of these remedies is taken. The disadvantage of these methods is that they do not solve the problem for future occasions. More important, by rendering anxious passengers lethargic and possibly confused, these "remedies" make it difficult, if not impossible, for them to cope with an emergency situation which might arise, such as the need to make a speedy exit from the aircraft.

Another coping strategy is to avoid any features of the environment that have the potential of exacerbating the unpleasant feelings of fear. This might include not listening to news bulletins on the way to the airport in case they mention air disasters. This strategy is counterproductive if it leads the fearful passenger to avoid listening to the flight attendant's safety briefing, or to avoid reading the safety card.

While some passengers might exhibit recognizable signs of fear, being tense, while-knuckled and unable to eat, others may cope by concealing their feelings under a surface of bravado or beneath a brusqueness approaching incivility. Excessive seeking of the attention of the flight attendants can be interpreted as a mechanism for reducing fear by re-enacting the scenes in childhood in which the omnipotent parent will provide protection.

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Strategies for Managing Fearful Passengers

Training for the management of fearful passengers involves the development of practical skills, based upon technical knowledge, and possibly using role-playing techniques. The main problem is to ensure that the passenger is able to endure the flight without major trauma and without disturbing other passengers. Nothing more than crisis management is possible or appropriate.

The first task is to identify the fearful passengers. The range of coping behaviors is wide enough to permit the conclusion that any deviant passenger is likely a fearful passenger. Whether or not this is true, it allows flight attendants to interpret unwelcome behavior in a way that helps them to maintain control over the situation.

Some fearful passengers appear frozen and unresponsive. Others are very vigilant for signs of impending disaster, such as a fire in the cabin, or the failure of an engine. For these passengers, unfamiliar sounds or the expressions on the faces of flight attendants may be interpreted as evidence that something is amiss and they may show signs of restlessness, sometimes to the point of hyperactivity. A common response to stressful situations is to regress to earlier, more immature behavior, some of which may be antisocial in nature, akin to the temper tantrums of infants. These behavior patterns call

for a response from the flight attendant which is firm and calm, providing explanations in a straightforward manner, and generally giving the impression of strength and control.

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Subsequent research projects conducted by Edwards in the area of human factors have included studies of robot ergonomics, accidents in the home, industrial safety systems and the design of public transport road vehicles.

In 1985, Edwards was joined by her husband, Professor Elwyn Edwards, in establishing their consulting company, Human Technologies. They co-authored the book, "The Aircraft Cabin," published in 1990 by the Gower Publishing Co. in England and the United States.

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CABIN CREW SAFETY

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