# Psychological Factors Post Military Aircrew Selection: A Clinical Perspective

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Military aircrews undergo rigorous psychological and medical testing during the selection process. This paper discusses information gained from aircrew who have been referred for clinical psychological evaluation for four main reasons i) fear of flying (FOF), ii) loss of motivation to fly/failing aviator syndrome, iii) traumatic experiences such as an ejection or Prisoner of War (POW) experience, and  iv) psychological factors affecting medical conditions such as those in musculoskeletal disorders. Projective evaluation using Rorschach indicated different patterns of emotional and perceptual responses in referred clinical and non clinical aircrew groups. Aeronautical adaptability which consists of flying ability, emotional stability and motivation to fly are characteristics which have to be considered when designing new selection tests with high predictive validity. Inputs from pilots who undergo evaluation in the mid career stage can help delineate important and relevant psychological characteristics which need to be screened at the aircrew selection stage.

**Keywords**: Fear of flying, motivation, ejection, POW experience

Adaptability for military aviation is a complex issue, which involves motivation to fly, ability to fly, and psychological/emotional suitability (Jones & Marsh, 2001).  Clinical assessment has to include the understanding of these three facets**.** Motivation involves the desire to fly. Ability involves various physical, cognitive, autonomic, neurophysiological, and psychological attributes. These include spatial perception, mental calculations, suppression of emotional reaction to emergent situations in favor of analysis and correct action, psychomotor skills and alertness to a wide variety of sensory inputs along with an accurate filter that screens out stimuli of no aeronautical importance. Matters relating to personality, attitudes and interpersonal relationships comprise stability. A balance of these capabilities is necessary to fly safely and well.

These attributes encompass maturity, attentiveness, perception, anticipation and judgment to make correct decisions related to flying; and the hardiness and resilience to endure prolonged stressors in the flying career. It must be noted that the reference point here is not just clinical absence of organic/medical/neuropsychiatric conditions. What the system needs is a safe and effective pilot in the cockpit. Therefore, the reference should be a fully healthy and functional pilot who is likely to perform the required occupational role within the best of his abilities.

Military aircrew undergo rigorous psychological and medical testing during the selection process. Throughout the length of their career their medical category affects their present and future occupational role and status. Inputs from pilots who undergo evaluation in the mid career stage can help delineate important and relevant psychological characteristics which need to be screened at the aircrew selection stage.

This paper discusses information gained from aircrew who have been referred for clinical psychological evaluation for four main reasons i) fear of flying during training or otherwise ii) lack/loss of motivation to fly or the failing aviator syndrome iii) traumatic experiences such post accident/incident / ejection or POW experience iv) psychological factors affecting medical/psychiatric conditions such as those in musculoskeletal disorders.

### i) FOF

FOF is an unreasonable fear that develops in trained aviators who are free of other emotional symptoms (Jones, Katchen, Patterson & Rea, 1996). The term was coined during WW II and referred to the mixtures of fear and anxiety seen in aviators in combat theatres.

### Psychodynamics

FOF is characterized by the various defensive and maladaptive processes, which express excessive anxiety over various external or internal conflicts, frustrations, insecurities and danger. It may be a frank statement of uncontrollable fear of flying or frank refusal to continue flying.

Fear is a universal emotion. Flying, being an unnatural form of human locomotion arouses natural human fears. Deeply rooted in a person's mind is the idea that flying is a preternatural achievement. An aviator takes pride and derives satisfaction in flying – "the ultimate dream". He identifies the aircraft as an extension of self and as a symbol of added freedom, control and power. There is an exposure to real danger during flying. A fearful response to this danger is rational. A young pilot with healthy motivation may not comprehend the inherent dangers initially but gradually the reality of dangers dawns on him. This reality is countered with continued defenses like denial, suppression, rationalization, intellectualization and a new concentration on increasing skill and knowledge.
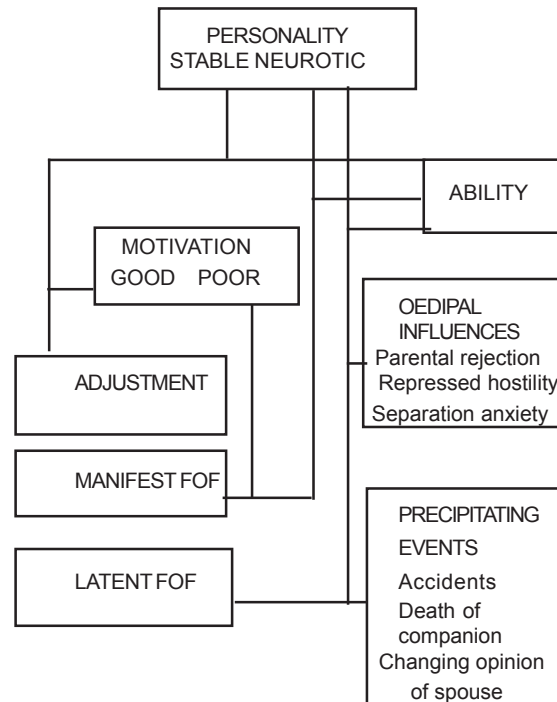


**Figure 1. Fear of flying**

Fear of flying has been classified (see Figure 1) as manifest or latent (Sours, Ehrlich & Philips, 1964). In manifest fear, the aviator readily agrees to his fear, but is emotionally stable. Motives for flying are ill defined. Symptoms disappear, once relieved of flying. In latent fear, the motivation to fly is strong, but due to recent life events (changing opinion of spouse, death of a companion, accident/incident) subtle changes of motivation occur. In these aviators, strong Oedipal influences may be projected as separation anxiety or repressed hostility. Paternal influence and a strong identification with the father may be present although this is a common finding in aviators.

One escapes from anxiety by avoiding the phobic object, or the phobic situation using a contra phobic object. In a counter phobic attitude the situation that might generate anxiety is actively channelled before it occurs. The danger that is faced on the outside and the anxiety that is generated within, are both overcome using physical and

intellectual means; thereby deriving pleasure in feeding the desire to fly. In such a situation people are not afraid of the idea of death, but enjoy an intense feeling of life.  When this organization of personality is broken down, fear and anxiety may reappear. The healthy adaptive mechanisms fail and the idea of possible death becomes conscious. Fear of flying is transferred into fear (sometimes as severe as suicide ideation) of being killed in an air crash.

If the defenses are adequate and appropriately developed the flier's career progresses unhampered. Flying is certainly a dangerous situation in reality and in imagination; but pilots when they fly not only feel safe, but also enjoy it. Aviators with emotional attachment to flying often display a strong motivation to continue flying, while others with cognitive attachment based on rational arrival of a decision to fly, may develop conflicts later (Jones, Katchen, Patterson & Rea, 1996). This conflict situation may precipitate FOF in a vulnerable aviator.

Therefore during the selection process individuals need to be screened for vulnerability to psychiatric conditions, lack of emotional stability, inadequate motivation based more on cognitive reasons to fly, and childhood conflicts. Select-in factors should include psychological resilience. More research is needed to distinguish both quantitatively and qualitatively, between healthy and unhealthy defence mechanisms in aircrew.

### ii) Loss/lack of motivation to fly

Young fliers may be truly fearless either because they do not understand the dangers of flight or they can consider them only as abstractions. As these realities are understood early in their flying careers through their own near misses, or through the death of their friends in aircraft accidents, the fears become part of their emotional lives and must be dealt with differently. These fliers

must move from the fearlessness of those who do not understand the truth of the matter, to the courage of those who understand it well and choose, even so, to continue to fly. Experienced fliers deal with their feelings about these real dangers by defence coping mechanisms, which usually include a combination of denial, humour, suppression, intellectualization and rationalization (Jones, 1986). Unhealthy ones are reaction formation, evasion, displacement and isolation (Patt, 1988).

Fliers are not afraid to fly because of the pure joy they derive from flying, the amount of anxiety mixed with natural fear, the extent to which the fliers' defences have been challenged by circumstance and the adequacy and maturity of the fliers' psychic defenses. The motivation to fly usually begins at an early age in the form of converting fear to thrill. While it can initially be counter phobic, it must eventually be transformed to thrill and/ or joy. This learned ability is positively reinforced with further mastery and eventually becomes a second nature. Cognitive, social and intrapsychic factors further add to the motivation to choose aviation as a career. The dangers and hardships of a career in aviation must be out-weighed by its joy and benefits.

There is no technological aid, which helps pilots fully adapt their minds to atypical flying conditions. They must rely on their own psychic resources ie. aeronautical motivation in the three levels of consciousness and defence mechanisms to counteract their aeronautical anxiety. According to Patt (1988) various relationships of motivation and defence give rise to the Flying Adaptation Syndrome (FAS) or various forms of flying disadaptation syndromes when pilots must face the dangers of flight. FAS = aeronautical motivation x defence mechanisms/ aeronautical anxiety. These alterations of psychic balance may cause temporary or permanent disqualification due to the impairment of safety  which they provoke.

Aeronautical motivation is made up of both emotional and cognitive components. For most fliers it is a combination of both; but one will be dominant. Motivation may be considered a dynamic balance between such positive factors as joy, emotional meaning and coping skills and such negative factors such as fear, anxiety and anticipated or experienced danger. Other factors such as financial rewards, social status and opportunities for travel may also apply but these are generally not the basis for psychological difficulties in the military. The pure emotional joy of flying is balanced by a healthy fear of its true dangers. Flying may also give rise to anxiety if these elements are threatened. Finally the flier's coping skills involved in basic resilience, hardiness and stress tolerance maybe be overcome by the actual dangers of flight as encountered in near-misses and mishaps involving self or friends or in combat situations where complete control is impossible (Jones, 1986; Patt, 1988).Some fliers choose to fly not so much because they love it, but on a more rational, less emotional basis; it's a good job, with many benefits. Such 'rational choice' fliers are not as emotional about flying. They may quit more easily, without much internal struggle when they are overwhelmed about the real dangers of flight.

Some fliers have flawed or pathological motivation to fly which may include living out a parent's fantasy, becoming more powerful than a parent, because of low self- esteem and inferiority, attempts to fulfill the desires of others, proving that they are not afraid, risk taking in search of thrills or neurotic drives arising from early childhood experiences involving power, control, authority and similar issues. Such pathological motivations contrast with the healthy motivational factors, and may underlie significant symptoms that lead to ineffective or dangerous flying behaviours, which may cause administrative disqualification if no diagnosable psychopathology is present. Weak or flawed motivation, or poor defences against the real dangers of flying, may be recognized during flying training, where they are termed "manifestations of apprehension" or in operational flying, where they may present as an emergent or acquired fear of flying.

Applicants for flying training have usually thought of becoming pilots since latency or adolescence. In adulthood, flying training is viewed as a growth experience and a step towards autonomy. This normal motive should be contrasted with impulsive and short-lived decisions to enter flying school. Such persons may enter aviation because of family problems, or to escape work, school or romance; their motivation is often evanescent (Adams & Jones, 1987).

A number of factors need to be considered when selection takes place. A pilot with healthy motivation must have the ability to recognize the real dangers of flying and the realistic demands of flight training and have the ability to transform the aggressive drives into well-calculated risk taking. Other factors are that he/she never contemplated a non aviation career, accepts implications of combat flying (being killed, killing enemies and civilians) and has a supportive family. The family or spouse's attitude can influence an aviator's career in either direction.

Socio-biological personal history details should also be given weight age Historical clues to healthy motivation to fly are long-standing desire to fly, participation in aviation related activities, having an aviator role model, and participation and involvement in risky hobbies. Past behaviour also predicts success in aviation. Good impulse control, good track record of accomplishments, stress coping skills, group participation and leadership skills are predictive factors.

### iii) Aircrew with Medical problems

Developing medical problems is a major psychosocial stressor for aircrew because the medical category affects his occupational/

flying status. Aircrew are usually referred for musculoskeletal and other disabilities, when suspected etiological factors are psychological. Psychological factors contribute significantly to the pathogenesis of medical illnesses, affect their course and may be a target for effective intervention. These factors in turn may also influence illness behaviour. Illness behaviour refers to the ways in which symptoms are perceived, evaluated and acted on by different people. It can be conceptualized as having emotional, cognitive and behavioural components.

Emotional factors have been implicated in the maintenance of illness behaviour. In studies of low back ache various psychological factors such as emotional dysfunction and personality have been implicated (Fanian et al. 2007; Linton, 2000) as they have been in other disorders such as migraine. Psychosocial factors have also been found to be important in aircrew with vasovagal syncope and musculoskeletal disabilities (Taneja & Joseph, 2007). Moreover emotional consequences of illness such as anxiety and depression are associated with a poorer outcome and influence duration of disability in low backache patients (Van der windt et al., 2007; Gatchel et al, 2008).

Cognitive behavioural theory and research have emphasized the role of cognitive factors in the etiology and maintenance of maladaptive illness behaviour. People may develop their own cognitive model of illness, that include beliefs about its etiology, its symptoms, the personal consequences of the illness, and the extent to which the illness is amenable to control or cure. In the case of fighter aircrew this cognitive model could also include rationalizations and beliefs about whether he can go back to fighter flying and if so whether he would be able to safely eject out of the aircraft without the possibility of dire/fatal consequences. This "illness perception" has been shown to be related to health outcome in chronic fatigue sufferers.

Some researchers have suggested that "somatic sensitivity" is an important determinant of illness behaviour, with certain individuals being unusually sensitive to and intolerant of normal bodily sensations. These patients may misattribute benign symptoms as a sign of serious disease, visit their doctor more often and become dissatisfied with their treatment. Health anxiety which may also influence illness behaviour, refers to a concern about health in the absence of a pathology or excessive concern when there is some degree of pathology. High levels of health anxiety lead to actions aimed at improving health or ruling out the presence of disease, including repeated consultations with medical practitioners. It may also lead to hypervigilance for bodily events and misinterpretations of normal bodily sensations, thus contributing to somatic sensitivity. Aircrew are generally concerned about their health status/category because it is directly related to their flying status.

Two groups of IAF aircrew who were referred for clinical evaluation were studied (Joseph & Roopa, 2010); those with musculoskeletal disabilities (MSD) and those with other disabilities (OMD). These groups were referred because the Av Med specialist felt that their symptoms were not in line with the clinical evidence for their musculoskeletal or other disability. The results on the Rorschach test, indicated four findings (a) Difficulties in optimal generalization of perceptual experiences found in both groups (b) aircrew in the OMD and MSD groups showed intellectual opposition to self indicating feelings of inadequacy and guilt, symptoms of depression (c) significant anxiety and somatisation was seen in the MSD group and the aircrew in the OMD group showed a trend (d) both groups showed non optimal emotional responsivity and reactivity.

One of the remedies suggested was adequate selection procedures which take into account optimal generalization of perceptual experiences, selecting out tendencies of depression, anxiety and somatisation, selecting in balanced emotional responsivity and reactivity and high level of psychological stress coping strategies.

iv) Aircrew who have undergone traumatic experiences - Ejection and POW experiences

The degree of severity of a traumatic event is positively associated with potential for psychopathology. This is not a one-to-one association, however. Social supports, cultural variables, and personality also play roles. Such experiences as accidents and incidents resulting from ejection from aircraft and the prisoner of war (POW) experience can be the most traumatic situations in aircrew experience. The study of psychological coping after surviving an ejection and that during captivity, as well as psychological health and pathology following repatriation, has implications for psychological selection and psychiatric planning for future wars.

## (a) Psychological consequences of ejection

A few studies have investigated the psychological consequences during an aftermath of an ejection from the aircraft. Zeller (1973) was the first to describe the experiences of 200 Air Force aircrewmen who were forced to abandon the safety of their aircraft and survive until rescue in the Southeast Asia area. He concluded that these harrowing experiences were tolerated remarkably well by the crewmen involved who, with rare exceptions, retained their objectivity and precision of observations. In 66% of the cases, there were no indications of any, but a completely smooth textbook operation. The finesse with which the entire sequence of events was accomplished, even when longer periods of time were involved, made the entire

experience appear so deceptively simple that the extreme traumatic potential is lost sight of.

The psychological deviations experienced were, for the most part, within normal limits and even those which were extreme did not reach the point of psychic incapacitation of the individuals involved. 33% of cases showed some type of adverse emotional reaction, including aimless or inept behavior or unnecessary behavior such as shouting into the microphone or talking too fast for intelligibility. In 22 instances there were omissions of actions which most of the time were not, but which could have been, critical. Panic was reported 14 times; anxiety, four times; and mildly irrational acts, six times. In only one instance were hallucinatory experiences reported. This one involved an injured man who, on the second night, believed that members of his squadron were there talking with him, telling him what to do. The study emphasizes the value of training and the resilience of the healthy, trained individual in even the most trying of circumstances.

Jones (1982) gave an anecdotal account of the emotional reactions to military aircraft accidents and he recounted the successful coping mechanisms that are used by the pilots which are endorsed and backed by the organization. He observed that if there is one mental defense mechanism that characterizes successful fliers, it is denial- an unconscious mechanism used to lower emotional conflict anxiety by disavowing thoughts, feelings, or external reality factors that are consciously intolerable. Denial of the real dangers of flying enables a successful flier, especially in fighter aircraft, to continue his career in the face of rationally undeniable evidence that "a person could get killed doing this." This denial extends into the squadron as an organization. The procedures involved in an accident investigation make fliers think they understand the accident. They are

officially reassured that it was preventable, and once again deny the danger by asserting their power over this particular set of circumstances. It is a mass denial of the dangers that have just been clearly brought home by the death of a comrade. Such events also are received at times with a certain amount of bravado. Defence mechanisms such as rationalization, sublimation, altruism, magical thinking and fatalism are all used in coping.

It was only in the late nineteen eighties that the issue of aircrew suffering from the emotional consequences of ejection was addressed. Based on the experience of military aircrew who survived an accident by ejection, 40% of RAF ejectees developed fits of anger, apprehension, anxiety, transient confusional states, paranoid disturbance, nightmares, flashbacks of the accident and fear of being entangled in a crashed aircraft. They also felt exhausted due to their intense preoccupation with the accident and their desire to return to flying had been diminished. Most of them felt that their training had not prepared them to cope with the experience of ejection. There was also evidence showing the emergence of traumatic growth or positive change in that several of them after the accident reprioritized what was important in their lives and concluded that spending time with family was more important than serving the AF (Fowlie & Aveline, 1985; Aveline & Fowlie, 1987).

A more recent study on IAF pilots (Taneja, Pinto & Dogra, 2005) noted that "such defense mechanisms should, however, not lead to complacency with regards to preparation for escape". The authors mention that the range of answers to the question on how best to handle ejection as an event probably summed up the emotional arousal that is possible with a life-threatening situation in the air. These emotional effects probably need more exploration to provide an understanding of the entire spectrum of such

changes in aircrew. Handling of aircrew by squadron peers/colleagues post-ejection is another area that can influence psychological recovery. They suggested that squadron supervisors and flight surgeons should provide enough opportunity to the aircrew to discuss freely his emotional feelings after ejection and mentioned that it is important to realize that psychological stress and psychological factors post-ejection could influence recovery from any ejection injury and should be covered as part of training aircrew to develop effective preventive methodologies and better coping strategies for escape. Aircrew have indicated that "sympathetic guidance and counseling during rehabilitation can be crucial to their emotional recovery" from trauma. The study found a significant inverse correlation was observed between feelings of fear and apprehension and altitude at the time of the emergency.

### (b) The POW experience

The prison experience was reviewed by Ursano and colleagues using debriefing reports and medical questionnaires completed by repatriated Vietnam-conflict POWs immediately after release. Using a factor analytic technique, seven stress factors were identified: (1) psychological maltreatment (2) physical torture and maltreatment, (3) solitary confinement, (4) interrogation, (5) threats and denials of privileges, (6) high resister status, and (7) duration of maltreatment. Looking at Minnesota Multiphasic Personality Inventory (MMPI) measures, Ursano et al found that withdrawal and detachment were related to successful coping only in the high but submaximal stress Vietnam-conflict POW group (those captured after 1969). In the maximum stress group, withdrawal and apathy were also present but they were not predictive of successful coping. In this maximum POW stress group, denial, repression, and suspiciousness were associated with better coping. This suggests

that cognitive coping strategies may be important in maximal stress settings after withdrawal from the environment has been attempted. With the passage of time, withdrawal and neurasthenia may be less helpful and other strategies such as fantasizing and pondering family concerns more useful. The stages of the POW captivity experience are as follows: capture, imprisonment, confinement, repatriation, and reintegration. Each stage has unique stressors (Ursano & Rundell, 1995).

Though not all POW experiences are comparable and a single POW experience varies with time.  Crew members of the Pueblo were examined just after their release. Men who did well during captivity often had personalities described as "healthy" or "schizoid." They used a wide variety of ego defenses, particularly faith, reality testing, denial, rationalization, and humor. Men who handled the stress poorly were frequently diagnosed as being passive-dependent and were more limited in the number of ego defenses they used. Schizoid behavior and introversion have been reported to be more adaptive than obsessive-compulsive, passive-dependent, or immature behaviors. Passive-dependency has been singled out as a particularly maladaptive response. Induction of dependency is advantageous to camp leaders in imposing their will. The psychological state of the POW during captivity has been described as dependency, debility, and dread (DDD). Identification of adaptive personality characteristics requires further study. It is clear that personality resiliency and the ability to tolerate passivity is positively related to optimal adaptation.

Sequelae of POW experience include medical and psychiatric illness, however personality changes resulting from the POW experience need not be pathological. Many former POWs report that they benefited from captivity, redirecting their goals and priorities and moving toward psychological health.

Particular MMPI profiles have been related to particular POW stressors. In the same manner as the development of psychopathology during and after captivity, nonpathologic personality change appears to be dependent on the nature and severity of the experience at least as much as preexisting personality.

As far as predictors of psychiatric distress are concerned, data of past studies support the view that psychiatric illness may develop after the POW experience without preexisting illness or identifiable predispositions. Most post-traumatic stress disorder theories have underestimated the role of adult personality growth and resiliency and overestimated the role of preexisting personality in determining the outcome of the POW experience. The importance of social interactions, social supports, group activities, and social isolation during captivity has been discussed. Most researchers believe that the more external support available to a former POW, the more likely a positive adjustment will occur.

Psychologists have discussed "organizers" of psychological development—important experiences that structure feelings, thoughts, and behaviors of the present and thus influence future psychological development. The oedipal phase and childhood traumatic events are two examples. It is useful to conceptualize adult traumas, such as being a POW, as a potential independent organizer of adult personality development. The experience may induce psychopathology or personality growth, or it may resonate with themes already present from earlier organizing events or periods. Later, the symbolic recall of the POW events is the result of a current event activating this "organizer." The recall serves as a symbolic vehicle to express the current conflicts and anxieties (Ursano & Rundell, 1995).

Research on prisoners of war indicates that some psychological attributes are

important for survival. It appears that personality flexibility positively influences survival potential and adaptability. Rigidity is less adaptive. Attributes of survival include: strong motivation for life, good general intelligence, good constitution, emotional insensitivity or well-controlled and balanced sensitivity, preserved sense of humor, strong sense of obligation to others, controlled fantasy life, courage, successful resistance, opportunism, and military experience. These attributes can be summed up to include flexibility of coping with stress according to the situation, adaptability and the use of defence mechanisms appropriately, personality resiliency and the ability to tolerate passivity.

## Conclusion

Psychological selection has to take into account the nature of different types of stressors that aircrew may encounter throughout the span of their career in the Air Force. This discussion has looked into four reasons why aircrew may be sent for clinical psychological evaluation; FOF, lack/loss of motivation for flying, psychological factors which may accompany physical/mental diseases and emotional consequences of traumatic events. Overall the evidence suggests that select out tests should screen for vulnerability to psychiatric conditions, behavioural problems and also dysfunctional personality styles, especially tendencies of depression, anxiety and somatisation. Other factors are lack of emotional stability inadequate motivation based more on cognitive reasons to fly, and childhood/ adolescent conflicts.

Select in factors should include flexibility of coping with stress according to the situation, adaptability and the use of defence mechanisms appropriately, personality resiliency, the ability to tolerate passivity, the ability to channelise aggressive drives into well-calculated risk taking and good impulse control. It appears that past research has underestimated the role of adult personality growth and resiliency and therefore positive psychology theoretical principles maybe more useful for devising effective selection tests. Future research needs to be geared towards more objective assessment of subconscious and unconscious drives and distinguishing both quantitatively and qualitatively, between healthy and unhealthy defence mechanisms in aircrew.

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