Anxiety and Performance Relationships in First Time Parachutists

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Sport parachutists voluntarily jumping from an airplane for the first time are faced with a consistent and highly stressful situation. The risk of serious injury or even death is always present. Fenz and Epstein (1967) and Fenz and Jones (1972) systematically monitored the physiological responses and self-reported ratings of fear in both novice and experienced parachutists. Their data clearly demonstrated high elevations in HR, GSR, respiration rate, and fear. The magnitude of change in the measures was similar between the two groups. The pattern of reactivity, though, was quite different. Experienced jumpers showed the greatest fear prior to reaching the airport, with continuous reductions occurring until the actual jump. Inexperienced parachutists showed continuous increases in fear reactions until a few minutes before the jump. Fenz (1975) reported the results of an unpublished study by Fenz and Jones in which additional individualized instructions and training were given to an experimental group of novice jumpers. When compared to a control group of novice jumpers who received more traditional forms of training, the experimental group displayed a different pattern of physiological response which was quite similar to the pattern found in the more experienced parachutists described in their previous research.

Hammerton and Tickner (1968) recorded significant elevations in military parachutists’ HR, which was taken in the barracks before they jumped for the first time. When task performance scores of the parachutists were compared with scores for the nonjumping control group, evidence revealed that the high anxiety reactions produced by the fear of parachute jumping depressed motor skill learning. Extensive reviews of the literature for anxiety and arousal influences on motor behavior strongly suggest an inverted-U relationship between anxiety level and performance efficiency (Malmo, 1959; Martens, 1974).

Previous research examining anxiety and motor performance relationships most often evaluates subjects during the initial acquisition of a skill, rather than after the skill has been learned. The anxiety produced within a subject is most often induced by stressors unrelated to the tasks used to evaluate performance. If further insight is

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to be gained as to how anxiety associated with a given activity affects performance in that same activity, then the best experimental situation occurs when the task itself is the stressor, and subjects have reached a reasonable degree of performance consistency as a result of task practice. The literature suggests that performance in skilled tasks recedes under conditions of excessive fear and anxiety. The purpose of this study is to examine the relationship between anxiety and motor performance using well-practiced parachute trainees experiencing their first parachute jump.

It is hypothesized that the psychological stress of a first parachute jump will produce large elevations in anxiety reaction as cognitively measured by self-report (Spielberger state anxiety scale), behaviorally measured by external observation of verbal and nonverbal fear responses, and physiologically measured by heart rate (HR) elevations just prior to jumping. Accordingly, it is expected that all three measures will show significant positive intercorrelations. Concurrent with the inverted-U hypothesis is the expectation that subjects’ anxiety response will be negatively correlated with the overall quality of parachute jumping performance. The quality and extent of training is also expected to exert an influence upon the degree of anxiety measured and the quality of performance.

Method

Volunteer subjects were 11 males and 4 females enrolled in and trained at a large public university and 4 males and 1 female enrolled in and trained at a small private university. All were naive to parachute jumping and signed a liability waiver explicitly outlining the risks and emergency procedures associated with sport parachuting and emphasizing the potential fallibility of parachute equipment. Following an introductory lecture on parachute equipment, the mechanics of deployment and opening, aerodynamics, steering and wind effects, subjects completed the adult version of Spielberger’s STAI trait anxiety questionnaire. Resting HRs were recorded by palpation of the radial artery after subjects had been seated quietly for at least 15 min.

Aircraft exit (jump) techniques were practiced by subjects to satisfactory levels of competency while suspended in an actual parachute harness. Explanations of emergency procedures applying to various types of malfunctions were described and practiced in the simulation harness. Sensations associated with parachute malfunction were simulated by shaking and swinging subjects in the harness. Subjects jumped from a 4-ft. platform onto a thin mat to practice proper landing technique. The five private school subjects received greater individualized instruction and spent twice as much time (45-60 min) suspended in the harness as the public school trainees. No subjects were permitted to jump until they demonstrated sufficient knowledge and skill in all aspects of training.

Prejump arousal was estimated in three ways. The STAI state questionnaire was administered to each subject immediately prior to boarding the aircraft. Then, 20 sec before jumping (4-8 min following STAI administration) subjects’ HRs were measured by palpation of the carotid artery by a skilled assistant. Subjects’ manifestations of fear of the impending parachute jump were carefully noted by a previously trained and highly experienced jumpmaster. Fear ratings, based on the presence or absence of a variety of verbal and nonverbal behaviors, were assigned to