A Visual Comparison of Psychological Profiles Between Able-Bodied and Wheelchair Athletes

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The purpose of this study was to visually compare the psychological profile of 33 male wheelchair athletes who competed in track and field events, with previous results of able-bodied athletes. Based on the data gathered using the Profile of Mood States and the State-Trait Anxiety Inventory the wheelchair athletes demonstrated a profile similar to that of able-bodied athletes. This finding was discussed in terms of mental skills that may be developed by wheelchair athletes because of their injuries, possible influence of medication, and higher level of demonstrated anger.

Considering that the human body is made for movement, it is a universally accepted fact that sports are one of the activities that are extremely healthy for man. Unlike the machines invented by man, the human machine deteriorates with inactivity. (Monnazzi, 1982, p. 85)

Thousands of individuals confined to a wheelchair are actively involved in competitive sports. Compared with sports for the able-bodied, however, the advent of competitive wheelchair sports is relatively new. Initially, wheelchair sports were designed as a part of the rehabilitation process for soldiers during World War II. In 1944, the first wheelchair athletic program began at the National Spinal Injuries Center of the Stoke Mandeville Hospital in England. The first organized wheelchair athletic event (basketball) was held in the United States in 1947. By 1952, programs had increased to such a degree in numerous countries that the first international competition was held at Stoke Mandeville. Today the Stoke Mandeville Games are held annually and every fourth year the Games are held in conjunction with the International Olympic Games. In addition, numerous local, regional, and national wheelchair events are held on a year round basis with national championships in such activities as basketball, track and field, marathoning, and archery.

The primary values of wheelchair sports have expanded far beyond the rehabilitation phase and parallel the assumed values espoused for able-bodied athletes such as: development of self-control and self-discipline, increase in social status, worthy

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use of leisure time, increase in physical well being, opportunity for competition, and opportunity to develop teamwork and cooperation (Kniker, 1974).

Historically, the emphasis in training for able-bodied and wheelchair athletes for competition has been based on the physiological factors that influence successful performance. While the physiological aspects of training are essential for performance and are the foundation for the competitive athlete, it is imperative to consider the psychological factors which are also integral components of successful competition and improved performance (Fodero, 1980; Henschen, Edwards, Gordin, & Ravizza, 1982; Morgan & Johnson, 1978; Williams & Parkin, 1980). The elite athlete will consider all aspects of physical and psychological training, as well as the design of the equipment if the competitive edge is to be maintained. For instance, the influence of specific personality traits of an athlete in a competitive atmosphere could raise or lower the anxiety to a level that may impede optimal performance. When personality characteristics are identified that hinder performance or indicate a psychological weakness then training programs may be initiated or modified (i.e., relaxation training, biofeedback) by the coach to interact with a specific athlete to “fit” the individual psychological profile of that athlete.

The purpose of this investigation was to visually compare the psychological profile of male wheelchair athletes, who competed in track and field events, with results obtained in past investigations on able-bodied athletes. The results will also be utilized to assess specific characteristics of the male wheelchair athletes which may be useful in enhancing the precompetition psychological preparation of the wheelchair athletes. Furthermore, it is hypothesized that male wheelchair and able-bodied athletes will demonstrate similar precompetition psychological characteristics.

**Methods**

**Subjects**

The subjects for this investigation were volunteer male wheelchair athletes \(N=33\) who competed in a Regional Qualifying Track Meet for national wheelchair competition in April, 1983. These subjects were between 18 and 35 years of age with a variety of lower limb impairments resulting from spinal cord injuries, polio, or amputations. Degree of impairment included both quadraplegia and paraplegia.

**Evaluation Instruments**

The athletes were asked to complete a personal data questionnaire and two psychological self-report instruments: The Profile of Mood States (POMS), and the State-Trait Anxiety Inventory (STAI). The emotional state of the subjects was measured by the POMS (McNair, Lorr, & Droppleman, 1971). The test-retest reliability of the six subscales of the POMS over a 20-day period ranges from .65 for vigor to .74 for depression. The internal consistency of the six subscales of the POMS range from .87 to .95. Morgan (1980) stated that: “of all the psychological tests my colleagues and I have experimented with, we have found the Profile of Mood States (POMS) to be the most highly predictive of athletic success” (p. 97).

Research has provided evidence for the predictive and construct validity of the POMS. Utilizing short-term psychotherapy researchers administered the POMS to 180 Veterans Administration outpatients over an 8-week period. All subjects experienced a
significant level of improvement, after the treatment period, on all subscales of the POMS except vigor. It was indicated in a study of controlled outpatient drug trials that the subscales of the POMS are sensitive to short-term changes caused by medication. In addition, from studies of emotion inducing conditions it is evident that the POMS is also sensitive to mood changes caused by a stressful event such as athletic competition (McNair, Lorr, & Droppleman, 1971).

Concurrent validity was established from a sample of outpatients who completed a modified version of the Hopkins Symptom Distress Scales (Parloff, Kelman, & Frank, 1954). Nearly all the subscales of the POMS are moderately to highly correlated with the three symptom measures derived from the Hopkins Symptom Distress Scales (Parlott, Kelman, & Frank, 1954), ranging from .33 to .86. The subscale of vigor has a correlation ranging from -.35 to -.49, which is acceptable because of the opposite nature of vigor to the three symptom measures of somatization, anxiety, and depression (McNair, Lorr, & Droppleman, 1971).

The State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1967) was used to assess anxiety (state and trait). State anxiety is that form of anxiety that is felt at any one particular time; while trait anxiety is the amount of anxiety a person has in their personality at all times. State anxiety is spontaneous while trait anxiety is long-term. Each subscale of the STAI (state and trait) contains 20 items which indicate how a person reacts in specific situations in terms of anxiety. The 104 day test-retest reliability was .77 for undergraduate college females and .73 for undergraduate college males ($n=484$). Internal consistency as measured by the Kuder-Richardson 20 formula ranged from .83 to .92. The construct validity was established from a sample of 977 undergraduates at Florida State University. Students were administered the A-State Scale with standard instructions and then asked to respond to the questions in accordance to how they perceived they would feel just prior to the final examination in an important course. The correlation coefficient for the entire scale was .73 (Spielberger, Gorsuch, & Lushene, 1970).

Collection of Data

All athletes were notified through the normal written correspondence concerning the meet by the director of the Regional Track and Field Meet that a study would be conducted (at the meet) which would eventually be related to the psychological characteristics of able-bodied athletes. At the meeting prior to the beginning of competition, the researchers fully explained the study and answered any questions related to the investigation. One hour prior to each participant's first event the questionnaires were distributed, completed, and collected. Directions to the subjects on both tests included the stipulation that all questions were to be answered according to how they felt during the past week. These procedures were similar to the methods utilized in previous research studies using the able-bodied population. Approximately 20 minutes were required to complete the three forms. One exception was that help was provided for individuals with higher level injuries who physically needed assistance in crossing out or circling their responses. This was accomplished by having the subject point to the response which was then circled by the investigators. In this manner no verbal interaction occurred and administration procedures remained constant for all participants.
Results

The hypothesis of this investigation was that male wheelchair athletes would demonstrate a similar psychological profile to elite level able-bodied athletes when data was examined visually. Comparing the wheelchair athletes scores, on the POMS test, with elite level athletes scores in previously reported research revealed a number of interesting factors.

Illustrated in Figure 1 are the scores of the male wheelchair athletes, and elite level (male and female) gymnasts. On the POMS test the wheelchair subjects demonstrated the following scores: tension 38.26, depression 42.11, anger 45.43, vigor 62.40, fatigue 42.34, and confusion 38.94. Henschen, Edwards, Gordin, & Ravizza (1982) studying 142 collegiate gymnasts (male and female) competing in the NCAA championships reported POMS test results similar to those achieved by male wheelchair athletes (see Figure 1).

Morgan and associates assessed Olympic oarsmen (1978); top marathoners, and middle distance runners (1977); and Olympic wrestlers (1977) utilizing the POMS instrument. Illustrated in Figure 2 are the profiles of these elite athletes in visual comparison with the wheelchair athletes in this investigation.

A visual comparison of the mean test scores on the POMS for three groups of world class athletes with male wheelchair athletes indicates that all groups demonstrated similar profiles. The wheelchair athletes scored the lowest on the tension, depression, anger, and fatigue subscales. They were also very high in the vigor category.

![Figure 1 — Visual comparison of male wheelchair athletes POMS scores to previously reported scores of elite able-bodied male and female gymnasts.](image-url)
The second instrument utilized in this study was the STAI. The male wheelchair athletes scored low on trait anxiety (M=34) and average on state anxiety (M=41). These results are consistent with what has previously been reported in the literature. “Traditionally it has been assumed that individuals possessing generally high levels of anxiety will tend to perform poorly when confronted with some stressful situation, whereas those scoring low in tests of general (trait) anxiety will not evidence that same tendency to disrupt their performance” (Cratty, 1983, p. 118). Several other researchers have reported that complex motor skills are adversely affected by high levels of anxiety increased up to an optimal point, at which time additional increases in state anxiety are detrimental to motor performance (Sarason & Palola, 1960; Sarason, 1961; Martens, 1977; Cratty, 1975).

One result of this study was particularly fascinating. A visual comparison of the mean test scores on the POMS test between male wheelchair athletes and various groups of elite level able-bodied athletes reveals that all of the groups (including wheelchair athletes) manifest an Iceberg Profile. The Iceberg Profile involves scoring below average on tension, depression, anger, fatigue, and confusion while scoring very high on vigor (Morgan, 1980). This profile is also indicative of above average moods and below average anxieties. Interestingly, even though all the elite level athletes approximated the iceberg characteristic, the male wheelchair athletes were closest to the ideal “iceberg.”

Discussion

Recently researchers have reported that, regardless of the sport, world class athletes demonstrate a particular emotional disposition which is normally referred to as the
Iceberg Profile. It was the purpose of this investigation to visually compare data denoting the emotional set of wheelchair athletes with those of their able-bodied counterparts. Possibly, the most impressive result was that the wheelchair athletes demonstrated an even more ideal psychological profile than did able-bodied athletes. The reason for this profile can only be conjecture, but it may be that wheelchair athletes have been forced, because of their injuries, to develop their mental skills more fully than able-bodied athletes. Many of the wheelchair athletes indicated that the mental skills were absolutely essential and a challenge which they could overcome.

Another unexpected finding of this study was that wheelchair athletes expressed a moderately high level of anger in their profiles. Again, this is not explainable under the ramifications or structure of this investigation; however, wheelchair-bound individuals do seem to demonstrate more anger than the able-bodied. While it was not the intent in this exploratory study to probe deeply into the different psychological characteristics between wheelchair and able-bodied athletes, it is interesting to speculate on why the wheelchair athletes, as a group, exhibited a higher level of anger than would be expected on the profile.

Anger is basically an aroused psychological state involving an increase in the autonomic system function and muscle tone. Anger is a perfectly normal reaction as long as it is in proportion to the social, emotional, and physical conditions. The expression of anger can serve a positive purpose. It can be substituted for a more comfortable feeling of anxiety and provide relief from the tension that comes from being frustrated, disappointed, or threatening to self-esteem (Hayes, 1963).

Persons, though, who live in a continually deprived, frustrating, and stressful environment (Moyer, 1976), in which many wheelchair-bound individuals perceive themselves, are more readily and intensely aroused to anger. This could be one explanation for higher than expected scores on the profile. Another explanation is that one stage, that has been suggested that a person (Werner-Beland, 1980) generally goes through after becoming wheelchair-bound is referred to as anger. The person, in effect, is expressing his/her rage or anger at becoming disabled. It is interesting to note that all the subjects, with the exception of one, had acquired disabilities due mainly to automobile accidents. Many of the accidents occurred within a 4-year period prior to the track and field meet.

Furthermore, it should be noted that the effect of medication on the wheelchair competitors was not considered in the design of the present study. This could have affected the psychological profiles of the athletes. McNair, Lorr, and Droppleman (1971) reported that certain medications influenced the scores of patients who were receiving psychotherapy. Therefore, the results of this exploratory study must be interpreted with caution since almost one-fourth of the sample were taking some type of prescribed psychoactive medication which could alter their moods and psychological status. Others were using amphetamines which stimulate the nervous system and are generally prescribed for depression. Amphetamines reportedly have been used by able-bodied to produce a sense of bravery to support performance of high risk physical acts (Hafen & Peterson, 1978). Other wheelchair athletes were using minor tranquilizers, such as Valium, to control skeletal muscle spasms. This type of medication though is also prescribed by physicians to control anxiety.

Further research needs to be conducted utilizing handicapped individuals as subjects. If the preliminary results of this study are replicated using a larger sample and a more stringent research design, it should demonstrate that high level male athletes (both wheelchair and able-bodied) have similar psychological profiles. This information will be invaluable to athletes and coaches in preparing for competition. It may well be
that, by including psychological training in the athlete's program, a certain psychological profile which is a prerequisite to world class physical performance will be attained.

References


