

THE RELATIONSHIP BETWEEN AGGRESSION AND ANXIETY IN DIFFERENT SPORT  
CATEGORIES

A thesis submitted to the University of Manchester for the degree of  
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1997

PINELOPE IOSIFIDOU

Volume I of II

DEPARTMENT OF PHYSICAL EDUCATION

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## ABSTRACT

This study attempted to investigate the relationship between the athletic aggression types and competitive anxiety (A-Trait, and A-State) across sport categories and gender. The athletes' aggression and competitive anxiety levels were examined first for differences due to the nature of sport (contact, non-contact, team, individual) and gender (males, females). The Multivariate Analyses of Variance (MANOVA) which were performed revealed differences in aggression and competitive anxiety levels of athletes. Thus, the relationships between aggression, competitive A-trait and competitive A-state were tested separately for each category.

To assess Greek athletes' aggression, a new instrument, the Athletic Aggression Inventory (AAI) was constructed based on the model of athletic types of aggression proposed by Hodgson (1990). The AAI measures the Honest, Cynical, and Angry aggression. Results from both the pilot study and the main research supported the main athletic types of aggression of Hodgson's model and confirmed the validity and reliability of the AAI.

To assess athletes' competitive anxiety, the Sport Competition Anxiety Test (SCAT) (Martens, 1977) and the Competitive State Anxiety Inventory - 2 (CSAI-2) (Martens et al., 1990) were used for measuring Trait anxiety and State anxiety respectively. Both measures were standardized with Greek athletes and demonstrated satisfactory reliability.

Male and female athletes of four sport categories, competing at a high level, participated in this study. All measurements were carried out during the official competitive period. The AAI and SCAT were completed at the end of a training session while the CSAI-2 prior to competition.

Regression analysis, and crosstabulation were used to examine the relationship between aggression types, competitive A-trait and competitive A-state. The results revealed that a) athletic types of aggression (mainly the honest and angry type) can be predicted from A-trait and/or vice versa; and b) competitive A-state can be partly predicted by athletic aggression (mainly honest and angry) types. The results are discussed and the strengths and limitations of the study along with the directions for further research are presented.

I declare that no portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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To my parents Sophia and Dimitris

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## CHAPTER 1

### I N T R O D U C T I O N

## Chapter 1 Introduction

### AGGRESSION AND ANXIETY IN SPORT

Aggression and anxiety are the personality factors that have monopolized the interest of many scholars from a wide range of disciplines. The fact that large volumes of literature concerned with these psychological states signifies their importance in sport and other social settings.

In the sport realm in particular, aggression has been considered by many as an important determinant of athletic performance since it increases an individual's and a team's chances for a better outcome, especially those of contact-collision sports (Widmeyer, 1984). In addition, aggression is one of the qualities that has been used to describe the personality profile of the successful athlete (Gaskell & Pearton, 1979). Thus, it is not surprising that the tenet "aggression pays" has dominated amongst athletes, coaches and administrators of athletics (Bredemeir, 1980) and that aggression surrounds the sport scene to the extent that it is regarded as being an integral part of sport competition (Fisher, 1976).

Anxiety on the other hand is regarded as a problem generated by sport competition itself such as, when competition becomes excessive or results in some form of punishment by the social environment (Santomier, 1983). Given the structure of competitive sports and what is at stake, and since there are only minor differences between athletes at a similar high competitive level in terms of their physical qualities (strength, speed etc.) required for each sport (Dunn, 1979), it is quite reasonable to expect athletes to experience high levels of anxiety often. Thus, anxiety is widely recognized as playing a major role in sport performance (Harger & Raglin, 1994). As Sonstroem (1984)

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has noted a large number of elite wrestlers who were involved in national championship competition characterized themselves as being nervous or worried in 66% of their matches. Athletes informal statements however, suggest even higher percentages.

Although aggression and competitive anxiety research appears to be important for sport participants from both theoretical and practical point of view, the issue regarding the potential of a relationship between them has not received the attention it deserves. For years the focus of attention has been the study of each of these psychological states in isolation and their joint investigation has been ignored. Evidence to support the scarcity of research in this issue over the past years is the fact that only one study in the field of sport psychology has attempted to examine it.

This lack of interest may be due to the belief that an anxious athlete can not be an aggressive competitor. In other words, aggression and anxiety are not usually experienced by the same person in a particular situation. However, information from diverse sources and studies which have been conducted in fields other than sport psychology, such as social, environmental, clinical psychology suggest otherwise. They provide directly or indirectly evidence for the relationship between aggression or anger with anxiety or stress at both the trait and state level. Hong and Withers's (1982) study indicated that high anxiety students had significantly more trait anger than had the low anxiety students. They noted that those who have a predisposition to react with high anxiety to stress are also predisposed to anger (see p. 158). Ben-Zur and Zeidner (1988) found a strong relationship between state anxiety and state anger and a

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moderate one between trait anxiety and trait anger in both male and female college students (see p. 157). Mook et al. (1990) results are in line with those of Ben-Zur and Zeidner (1988). They found that anger and anxiety are substantially correlated at both the trait and state level (see p. 156). The research findings of Wickless and Kirsch (1988) have also shown that thoughts of anger were related to thoughts of anxiety and other emotions (see p. 170).

On the other hand, arousal is a key concept that has been closely related to aggression and anxiety (see p. 145, p. 151). In particular, arousal was viewed by the major theories of aggression as a behaviour energizing force selectively applied, which combined with aggressive cues can increase aggression (Zillman, 1983). Zillman (1983) stressed that the circumstances under which arousal can operate are a critical factor for the energization of aggression. In other words, arousal can intensify aggression under provoking conditions such as those taking place in a sporting environment (see p. 148). Early studies findings (Hokanson & Burger, 1962) have shown that arousal increased as a function of provocation can take the form of ego-threat (as can be the case in anxiety), and goal-blocking (as in the case of aggression), without being mutually exclusive in a situation providing common ground for the experience of both aggression and anxiety.

The treatment of the arousal concept by theorists such as Bandura (1973) supports indirectly the aggression-anxiety relationship. He stated that arousal deriving from the instigation to aggression is likely to energize non-aggressive behaviours as well as aggressive reactions. He further asserted that aggression may be facilitated by aversive stimuli such as environmental stress (see p. 147). Indirect



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support is also provided by the research findings of Scherwitz et al. (1991) and Houston and Kelly (1989) which indicated the relation between cynical hostility and stressful experiences (see p. 158). Averill (1982) has pointed out that when individuals are in a state of psychological stress is quite possible to react in an aggressive manner (see p. 167). Also, Kashani et al. (1991), on the basis of their research evidence concluded that aggression is one way of dealing with fears and anxieties (see p. 140).

Apart from the above, convincing evidence provided by Izard (1971) supports the aggression-anxiety relationship. He stressed the significant influence sociocultural phenomena can have on emotions processes. He argued that *cultural* differences in attitudes toward certain emotions are incorporated during socialization and result in *different relationships among the emotions and between the antecedents, concomitants, and consequences of a given emotion*. He also proposed that each of the fundamental emotions has distinct components which are largely interdependent, but they also have a degree of independence and presented research evidence in support of his position. He further maintains that complex emotion processes such as anxiety contain as elements two or more of the fundamental emotions or their components. In the case of anxiety, among others, the emotions of fear and anger are involved (p. 163).

Moreover, according to Izard (1972) this relationship is supported in physiological terms by experimental and observational evidence. He argued that, although there are emotions that are identified with the sympathetic system or with the parasympathetic system, some other fundamental emotions such as anger both systems are

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involved. Under certain circumstances a combination or alternation of emotions, for example, anger with anxiety or fear would take place.

In the realm of sport, apart from the many instances which can affect participants psychological states, competition itself as an evaluative event and in particular the outcome of it, winning or losing, leads athletes to become aggressive and/or anxious. Van der Ploeg's (1983) findings support this view by showing that evaluative situations can result in combination of anxiety and aggressive reaction tendencies (see p. 159). Winning in particular has become a compulsion in contemporary sport. The "*winning is everything*" competitive ethic has become the "creed" of modern sport and for most athletes their highest priority goal (Burton, 1989). Many athletes base their perceived competence on whether they win or lose rather than on how they perform individually (Martens, 1993). This is not surprising in view of the early socialization in competitive sport on the one hand and the extraordinary pressures significant others (James & Collins, 1997), and in particular parents and coaches, put on athletes to succeed. Often, parents use their children's successes for their own ego enhancement while coaches, because their jobs demand success, drive their young athletes by overtraining, and reject those who fail (Burton, 1989; Purdy, Haufler & Eitzen, 1981). The children themselves have been socialized to accept nothing less than victory. As Devereaux (1979) has suggested, the structure of children's sports in America has become so organized and competitive that the participants have been robbed of their childhood. In addition, winning like other outcome goals is both uncontrollable and inflexible. Changes in expectations

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for success and the fear of failure are acknowledged by sport psychologists as actually responsible for the majority of athletes' problems with heightened levels of stress, anxiety, self-confidence and aggression (Martens & Burton, 1982; cited by Burton, 1989).

The pursuit of winning therefore can be seen as the starting point for aggression and anxiety since it prompts within the frustrated individual corresponding changes in psychological states (Martens et al., 1990; Morris, Davis & Hutchings, 1981).

Why then has research not been undertaken on the systematic examination of this issue in sport psychology? The answer to this question may be given through what follows:

A reason that may have limited aggression and competitive anxiety research within their own boundaries is their *complexity* and the confusion that surrounds the relevant concepts as well as the lack of conclusive findings regarding their origins and determinants.

Among the most prominent limitations that testifies to the complexity of these multifaceted constructs is the lack of a universally acceptable *definition*. In fact, the controversy revolving around this issue reflects differences associated with the major theoretical orientations. In fact, what is meant by the term athletic aggression and anxiety varies among those who are examining it. This is not to say that this state of affairs prevented research on aggression and anxiety themselves. However, this issue has to do with the limitation of scientific knowledge that is called reductionistic. That is, because it is too complex to study all the variables of a situation at the same time, isolated variables of the most critical interest may be selected. By reducing a problem to smaller manageable parts the

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whole picture may be compromised or diminished (Weinberg & Gould, 1995).

Apart from the complexity of these psychological states certain limitations of previous research in sport are associated with methodological and design weaknesses which account for a major proportion of inconsistent and contradictory results in the relevant literature and may also be regarded as an obstacle to the better understanding of these psychological phenomena (Cox, 1990; Leith, 1978). Examples of methodological problems that have plagued studies include a disregard for the problem of *response distortion* and *inappropriate data analysis* (Williams & Krane, 1989). This state of affairs has prevented research from reaching definite conclusions, and may have acted as a brake on attempts to investigate aggression - competitive anxiety interrelationships.

Other limitations of previous research in the field of aggression and competitive anxiety in sport concern *data collection*. For years investigators who have attempted to create reality in their experiments in *laboratories* suggest that their findings are valid in real world. The need for more research in *natural settings* has been stressed by other researchers who emphasize that, reality is often distorted by the controls and artificiality of the laboratory setting which cannot duplicate the factors and success/failure histories that influence behaviour in real sport contexts (Burton, 1989; Gaskell & Pearton, 1979). Because "no research design that simply places subjects in artificial environments and requires them to convert stimulus inputs into measurable outputs can be generalized to real-life situation" (Gaskell & Pearton, 1979; p. 267). The consequence however of adopting

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the research in natural settings orientation is a greater stress upon interpersonal behaviour in group activities, and complexity of situations with lack of control over variables.

Another weakness is concerned with the *design* of investigations. Most of the studies have focused mainly on male athletes and failed to include an examination of female athletic aggression and competitive anxiety. However, women's participation in competitive sport lends credence to the claim that, there is a need to design investigations of athletic aggression (Bredemeier, 1980) and anxiety (Martens et al., 1990) for both sexes.

The selection of the *instrument* together with the difficulty of measuring aggression and anxiety in field events, especially getting very close to or during the event itself, is the most critical problem. Since many of the existing instruments have been designed to assess aggression and anxiety in populations other than athletes, sport specific instruments are needed to assess behaviour in sport situations. Martens (1977) and Martens et al. (1990) responded to this challenge and developed the Sport Competition Anxiety Test (SCAT) and the Competitive State Anxiety Inventory-2 (CSAI-2) questionnaires to facilitate the assessment of competitive anxiety in sport. Bredemeier (1977) on the other hand constructed the Bredemeier Athletic Aggression Inventory (BAAGI), a sport specific instrument measuring athletes instrumental and reactive aggression. Later, a new model proposed by Hodgson (1990) seemed to incorporate the aggression types measured by the BAAGI and the assertive or athletic aggression proposed by Silva III (1983, 1984). Despite its weaknesses, which are discussed in the relevant sections, Hodgson's model seemed to offer further insight by

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describing the mental, verbal and physical components of each of the main athletic aggression types. However, Hodgson's model has not been empirically tested. In this thesis, this model will form the basis of a new sport-specific instrument named Athletic Aggression Inventory (AAI), the aim of which is to measure the main types of aggression.

There are large differences in aggression from culture to culture (Averill, 1993). According to Lore and Schultz (1993), even if aggressive impulses are universal, the appearance of aggressive behaviour reflects an interplay of nature and nurture (Geen, 1990). Human behaviour is influenced by the society and culture. Consequently, we cannot rely on research findings from one geographical area to explain all of human behaviour (Biddle, 1995). This is also the case in the sport context. Despite the similarities in exercise and sport psychology in Europe and North America or other geographical regions, it is important to carry out more "cultural" research in exercise and sport psychology, and to study the psychological phenomena in sport within the particular culture (Stephens & Bredemeier, 1996). Several measurement difficulties, however, exist to which the limited cultural research in sports can be partially attributed, such as, the different languages and slang terminology individuals from various cultures speak. Such variation may affect the validity of specific tests (e.g. nonequivalent interpretations across cultures) (Gauvin & Russell, 1993; Hayashi, 1996).

Culture also influences to some extent anxiety which is regarded by many (e.g. Spielberger, 1972) as an emotion. Emotions, and in particular the fundamental ones, are regarded as innate because they

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have the same expressions and experiential qualities which are subserved by innate neural programmes in widely different cultures from every continent. However, the fact that there are genetically based mechanisms for the emotions does not exclude the possibility for a modification of an emotion's aspect through experience. In addition to learning modifications of emotion expressions, sociocultural influences and individual experiences play an important role in determining what will trigger an emotion and what a person will do as result of emotion (Izard, 1977). As Ekman (1972) puts it, each culture has its own "display rules" and their violation may have more or less serious consequences for the individual. These cultural rules may call for inhibiting or masking certain emotions and the frequent display of others. Associated with cultural display rules are significant cultural differences in attitudes toward emotion experiences (Izard, 1971). For example, Swedish men have significantly more tolerance for anger experience than Greek men, whereas both these groups prefer to experience interest (in relation to joy) more than a number of other cultural groups (Izard, 1977). Averill (1976) has noted that many of the conditions which precipitate anxiety are culturally defined and the form of coping will necessarily be influenced by cultural norms. As many agree, anxiety reflects the sociocultural conditions prevailing during a given period. And, it is difficult to say that some society has a greater potential for anxiety (e.g. western) than do other cultures because good comparative data are scarce.

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### STATEMENT OF THE PROBLEM

Psychologists, acknowledging the importance and the need for cultural research, are increasingly taking into account the influence of culture and other sociocultural variables such as gender and ethnicity in studying human behaviour and other psychological states (Bernstein et al., 1994). The need for research in various cultural settings has also been stressed by sport psychologists as well (Biddle, 1995; Duda, 1985, 1986; Morgan et al., 1996; Thill & Brunel, 1995). Numerous research studies have attempted to investigate psychological states of athletes in their respective sports. However, there is paucity of data concerning Greek athletes psychological states. Moreover, there have not been any studies examining athletes' aggression, competitive anxiety and their relationship using gender and across sport categories for either Greeks or other culture's athletes.

The need to move beyond the examination of isolated psychological states and factors in research designs have been acknowledged recently by researchers (e.g. Gould, Eklund & Jackson, 1992a). This does not mean merely a superficial look at the selected factors and their relationship, but, a deeper examination when there is an association between factors. To do so however, and move one step further, the psychological states should first be examined separately, since, as far as Greek athletes are concerned, there are no previous research findings which could be used as guidelines. Therefore, the present study was conducted to measure and assess the aggressive behaviour and competitive anxiety levels of athletes in contact, non-contact, team and individual sports, and then to investigate their interrelationship.

The accomplishment of this goal requires sport-specific reliable



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and valid instruments within the Greek culture. In addition, the model of aggression types (Hodgson, 1990) has not been tested empirically nor validated before. Thus, it is imperative that, a) a new valid and reliable instrument is constructed to measure the aggression types of Greek athletes, and, b) existing anxiety instruments are tested on a Greek population.

### PURPOSES OF THE PRESENT STUDY

This study is aimed at investigating the issue of athletic aggression and competitive anxiety in sport with an emphasis on their *relationship*. More specifically, the study attempts to examine Greek athletes' aggression and competitive anxiety separately and then to investigate their interrelationships. In other words, whether an anxious athlete can be an aggressive participant as well, and if so, which type of aggression is the best predictor of anxiety (A-trait or A-state) and reverse. The scope of this research, however, is not limited to the testing of the relationship between aggression and competitive anxiety of athletes. Another long term challenge for this study is to provide a *sport-specific instrument* based on the aggression experiences of athletes of Greek culture. This instrument could then provide a common point of departure for sport aggression researchers in the future. In order to achieve these purposes and obtain a more comprehensive understanding of these psychological states several steps will be taken.

The aggression instruments which have been developed so far were based on experiences of individuals from other cultures. Their contribution has been of great importance for assessing psychological

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factors. However, having in mind that culture shapes people's behaviour, it was felt that it will not be wise to miss the opportunity to identify unknown factors -if any- which may influence Greek athletes aggressive behaviour. For the achievement of this purpose, qualitative and quantitative inquiry seemed to be the best means.

The model proposed by Hodgson (1990) will be used as basis for the construction of the new instrument to assess Greek athletes' honest, cynical and angry aggression. This instrument will be tested in a field study. Also, the standardization of the sport competitive anxiety questionnaires, namely, the Sport Competition Anxiety Test (SCAT) (Martens, 1977) and the Competition State Anxiety Inventory-2 (CSAI-2) (Martens et al., 1990) on the Greek athlete population is essential within the scope of the present study. Further, the methodological and design weaknesses of previous research will be taken into account.

As it has been noted earlier, one of the serious methodological weaknesses of previous research is the lack of systematic investigation of aggression and anxiety for both sexes. Apart from the biological differences there are also differences in the socialization of males and females in sports within each particular cultural context. Specifically, Greek women experience under-representation and inequality in the field of sport. There are views, overt or covert, which still remain embedded in the Greek tradition and which continue to support a pervasive assumption that men and women are opposite in a manner which crystalizes fundamental cultural values. Any analysis, therefore, which concerns Greek women should be placed within the broader context of cultural life (Harahousou, 1996). Taking into

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consideration this matter, it was deemed of a great importance first to investigate for *gender differences* in aggression and competitive anxiety and then to proceed with the investigation of the relationship of these psychological states. This necessity is stressed by the fact that the main body of the research literature is not conclusive with regard to gender differences and sport categories. Nevertheless, whatever the previous research findings have shown, since this study attempts to investigate aggression, and competitive anxiety in a cultural setting different than the ones in which previous research has been carried out, it seemed unreasonable to assume that these results could be applied to another population without an examination of the issue.

Apart from the theoretical significance of this issue there is also a practical reason for doing so. It was thought that if no gender differences are found with regard to aggression and competitive anxiety, the sample of both male and female athletes could be combined. Otherwise the relationships under study will be investigated and in terms of gender.

It is well known that each sport is a complex social organization with a separate set of rules which define and differentiate the behaviours of those involved in the particular sport (Silva III, 1984). In other words, each sport is characterized by a particular complex of relationships and roles that may have different impact on the participants. Therefore, is not reasonable to generalize from one type of sport experience to another (Bredemeier, 1988). Contact<sup>1</sup> sports

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<sup>1</sup>Contact sport may be defined as a sport which involves constitutively legal rule-sanctioned body contact in order to impede the progress of the opposition from its goal (Trichka, 1984).

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clearly apply different pressure on athletes and offer more opportunity for aggression than do non-contact<sup>2</sup> sports (Silva III, 1981). For example, a non-contact sport, like swimming, may have substantially different implications for tendencies to be aggressive than a contact sport like water-polo (Bredemeier, 1988). On the other hand, the existing evidence suggests that a group is capable of greater aggression than the individual (Bandura, 1973; Jaffe et al., 1981). In addition, individual sports evoke greater levels of competitive anxiety than team sports (Martens et al., 1990). Thus, the distinction between individual and team sports is also important. Hence, in the same vein as gender, separate analyses for each sport category, namely, contact, non-contact, individual and team will be employed first, to investigate athletes' aggression and competitive anxiety levels.

In addition to the above, another important distinction will be made, which concerns the level at which the actual game is played. Only team athletes from the first and second national category or those individual athletes who qualified for competing in certain athletic events such as Panhellenic National championships, will participate in this study.

In summary, the present study has been designed:

1. to develop a questionnaire to measure the athletic aggression types (honest, cynical, angry) standardised on a Greek population of athletes.
2. to examine differences in athletic aggression types with regard to gender and sport category.

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<sup>2</sup> Non-contact sport may be defined a form of sport which involves little or no body contact with the opposition during the athletic contest (Trichka, 1984).

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3. to standardize competitive A-trait and A-state instruments on Greek athletes.
4. to examine differences in competitive A-trait and competitive A-state with regard to gender and sport category.
5. to test whether athletes' aggression types could be predicted from their competitive A-trait or vice versa.
6. to test whether athletes' competitive A-state could be predicted from their aggression types.

Finally, the main scope of the study is to use a quantitative approach in terms of the analyses of the results employing multivariate statistical analyses in order to accomplish the above goals.

### SIGNIFICANCE OF THE STUDY

The Model of Aggression Types accounts for all the main types of athletic aggression providing the clearest picture of the many aspects of athletes' aggression and allows for a more accurate estimation of them. The types (and subtypes: mental, verbal, physical) of aggression reflect different "systems" of response to aggressive stimuli. The treatment therefore for the control of aggression may be more efficacious, if the method of treatment is directed at the type of aggression most activated by the aggressive stimuli in sport context. The assessment of aggression types requires an instrument so that these to be measured both reliably and validly. Although the construction of an instrument is a laborious and troublesome task, the development of a new measure designed to assess the honest, cynical and angry type of aggression was decided. This decision was enforced by the belief that it will provide much more depth of understanding relative to factors

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associated with the aggressive behaviour of athletes within the Greek culture. A part of the significance of this study is that offers the opportunity to find out some of the factors influence Greek athletes aggressive behaviour.

After the instrument has been validated, it may be used as a research tool by a researcher to assess differences or similarities of athletes grouped in categories, such as sport, gender, age, or any other variable of interest that may be important in understanding aggression in sport and contributing to the expansion of our knowledge.

Competition usually requires intense forceful effort, in other words assertive behaviour, because assertion is a necessary ingredient for success and effective participation (Connelly, 1988). It is desirable therefore for athletes as well as coaches to increase the probability that assertive behaviour will be demonstrated properly and frequently while angry and cynical aggression will be under control. Coaches on the other hand are the persons who are close to athletes, but, they too often disregard the detrimental effects aggressive behaviour can have on athletes performance. As a sport-specific instrument the AAI measure can be used by a coach as a means to better understand his/her athletes' aggression, by identifying a person's areas of behavioural strengths (e.g. honest aggression) and weakness (e.g. angry or even cynical aggression) in the sport context and suggests ways for control or reinforcement of a particular aggression type.

It is well-known that precompetitive states play a critical role in competitive performance (Gould, Eklund & Jackson, 1992a). The standardization of the competitive anxiety instruments with Greek

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athletes can assist them to learn more about themselves. The results which can be gathered may be used by coaches to advise athletes on how to build their confidence, reduce or eliminate the negative effects of anxiety and reach optimal pre-competitive levels. In addition, these instruments can facilitate research with the Greek population in the future.

The present study is also important for another reason. This investigation responded to the need for gaining a more complete picture of athletes' psychological states especially of those competing at a highly competitive level. This need, nowadays, is more intense and prominent than in previous times. The study will attempt to examine psychological states jointly in one investigation, a need which has been stressed recently by researchers (e.g. Gould, Eklund & Jackson, 1992a, 1992b). This will allow the investigator not only to examine the aggressive behaviour and anxiety levels of athletes across sport categories and gender, but also to investigate the interrelationships between aggression, competitive trait and state anxiety on a Greek population.

For many people involved in sport to achieve successful outcomes of the goals they strive for, such as winning, or improving personal performance (Connelly, 1988), means that they must be able to control their anxiety and demonstrate assertive behaviour. Therefore, the importance of investigating these relationships mainly lies in the identification of the aggressive types that most closely relate to competitive A-trait and competitive A-state components in sporting situations. This can have important implications for predicting behaviour in sport (and subsequent performance) of athletes of

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different sport categories. It can also provide valuable information to sport psychologists for athletes' psychological states. It is not uncommon for the sport psychologist to be consulted with regard to an athlete who displays inappropriate aggressive or violent behaviour, or becomes overly anxious in sport competitive situations. The sport psychologists in cooperation with the coach, can assist athletes in imposing a greater degree of control over their internal states, and planning and applying the most effective psychological intervention in the shortest time. Instead of looking for strategies to alleviate athletes from high levels of anxiety and inappropriate aggression in isolation, knowing the possible relationships of these psychological states, both problems can be tackled together by directing and focusing the efforts on the particular aggression type and anxiety. This will enable athletes to be more effective as, most of the time, winning or losing depends on athletes ability to keep under control their aggression and anxiety (Connelly, 1988).

Significant contributions to the research literature can also be made by recognizing and correcting methodological problems (Morgan, 1980a). Serious methodological problems include: a) a disregard for the problem of response distortion and b) inappropriate data analysis. With regard to the first one, extra attention was paid in the present study to minimize response bias at all stages of the research, namely, during the development of the AAI, the standardization of the competitive anxiety instruments on Greek athletes and during the collection of the research data by employing several techniques. As regards the second problem, it involves selection of appropriate methods for analyzing and screening of data. The necessary procedures for screening of data



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become even more crucial when multivariate statistical methods are employed (Renger, 1993; Tabachnick & Fidell, 1989) and will be followed in this investigation.

Because the study was carried out in a field setting, in training practice and near to competition, it gives it greater validity (Adams & Schvaneveldt, 1991; Burton, 1989; Elko & Ostrow, 1991). According to Martens (1978a, 1978b), it places greater significance on the behaviour as it occurs naturally within the social context of sport.

Finally, it is hoped that the results of this study will contribute to the expansion of the knowledge in sport psychology in general, and within the Greek culture in particular, which is limited at the present time.

### STRUCTURE OF THE STUDIES AND THESIS

This study is organized into six chapters. Following this *introductory part* (Chapter 1), the sections of the *second* chapter are primarily focused on presenting a review of the literature on aggression, culture, competitive anxiety and research findings concerned with the relationship between aggression and anxiety.

In the *third* chapter the study I is described. This study was completed in 4 phases, and dealt with: the construction and validation of the AAI; the pilot work; the main study results concerned with the differences in aggression for gender and sport category using the AAI; and, the discussion of the results.

In the *fourth* chapter, the study II is described which dealt with: the standardizing procedures of the Sport Competition Anxiety Test (SCAT) and the Competitive State Anxiety Inventory-2 (CSAI-2)

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instruments on a Greek population; the results of the main study concerned with the differences in competitive trait and state anxiety for gender and sport category; and the discussion of the results. The study II was completed in 6 phases.

Following, the study III was carried out by taking into account the results which were revealed in study I and study II. Statistical analyses were performed in order to examine the relationships between aggression, competitive A-trait and competitive A-state across sport categories and gender, followed by the discussion of the results. This study was completed in 5 phases, and is described in chapter *five*.

In the *sixth* and final chapter of this thesis a summary of the findings, the strengths and limitations of the study as well as recommendations for further testing the athletic aggression types and competitive anxiety relationships is presented.

Below, Table 1.1 summarises the objectives of each study and their phases.

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**Table 1.1: Summary of the Objectives of the Three Studies and their Phases**

| Studies   | Objectives  | Phase   | Carried out  |
|-----------|---|---------|--|
| Study I   | Athletic Types of Aggression                          | Phase 1 | Development of the AAI - Pilot study results                   |
|           |   | Phase 2 | Main study results of AAI                                      |
|           |   | Phase 3 | The main study results for differences in aggression           |
|           |   | Phase 4 | Discussion for the aggression results                          |
| Study II  | Competitive Anxiety (A-Trait, A-State)                | Phase 1 | The measurement of SCAT  |
|           |   | Phase 2 | The measurement of CSAI-2                                      |
|           |   | Phase 3 | The main study results of SCAT                                 |
|           |   | Phase 4 | The main study results of CSAI-2                               |
|           |   | Phase 5 | The main study results for differences in competitive anxiety  |
|           |   | Phase 6 | Discussion for the competitive anxiety results                 |
| Study III | Relationship between Aggression & Competitive Anxiety | Phase 1 | Predictions using regression analyses                          |
|           |   | Phase 2 | Predictions using High-Medium-Low scorers groups               |
|           |   | Phase 3 | Regression plots   |
|           |   | Phase 4 | Crosstabulations   |
|           |   | Phase 5 | Discussion of the aggression-competitive anxiety relationships |

## CHAPTER 2

# REVIEW OF THE LITERATURE

## Chapter 2: Review of the Literature

### AGGRESSION

Aggression is a term very familiar to everyone. Aggression can occur in many different situations and it takes many different forms (Pinel, 1990). Perhaps, this is the reason why this term is laden with many different meanings. In its ordinary common usage, aggression defines an emotional state which is described by many people as a desire to inflict harm accompanied with feelings of hate (Rosenzweig & Leiman, 1989). Thus, sharp criticism has rendered aggressive behaviour as an undesirable characteristic, except in a sporting context. However, the growing number of incidents of aggressive behaviour in sport settings has caused concern over recent years. A great deal of attention has been focused on aggressive behaviour in sport both in popular and scientific literature, especially concerning the use of excessive force by athletes (Connelly, 1988).

Especially for athletes involved in sports requiring direct or interactive competition, successful outcomes of the goals they strive for (winning, improving personal performance or enjoying the competitive experience) involve confident, intense, forceful effort. These are the elements of competition required of athletes in particular from those at the higher levels of competition. In other words competition usually requires some sort of assertive behaviour, that is, intense forceful effort, in order to participate (Connelly, 1988).

When aggression is studied in sport and especially in competitive sport situations the major problem is that of definition. This may be due to the fact that one's behavioural repertoire provides him/her with the capacity to injure another person using an infinite variety of ways (Dickinson, 1976). Since there is not a universally acceptable

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definition the term is often misused labelling several qualities or components of behaviour as aggressive and giving either negative or positive meaning. Yet, appropriate forceful acts and inappropriate ones have often been labelled as aggressive and categorized together as if they were the same phenomena (Husman & Silva III, 1984). The term aggression has been used as an all-purpose descriptor for forceful play, when in fact there are many forceful behaviours falling within the rules that may not involve the injurious intent associated with aggressive acts, for example, coaches use the term aggressive play frequently, and it may be assumed that they do not mean behaviour that intends harm (Connelly, 1988). Husman and Silva III (1984) very rightly noted that the clear identification and labelling of aggressive behaviour in sport settings has important ramifications for both participants and researchers because the improper labelling of behaviour as aggressive can often lead to retaliatory behaviour that in turn escalates aggressive exchanges between participants. Also, frequently, terms such as anger, hostility, and violence are used interchangeably with the term aggression. Thus, at this point, it will be helpful first to introduce several important terminological distinctions, and further to provide definitions relevant to the sport context, which will facilitate the discussion on aggression in the following sub-sections.

### DEFINITIONS

*Anger* has been defined as a subjective experience that accompanies certain forms of aggression, and as a physiological arousal state coexisting with fantasied or intended acts, which enhance the

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probability of aggression (Kaufman, 1970; cited by Martens, 1975a), and also as an intervening variable that mediates the effects of frustration on aggression. Averill (1982, 1983) on the other hand argued that there are two aspects with respect to anger. The first aspect is referred to anger as a socially constituted syndrome. The assumption underlying the definition of emotions as syndromes is that no single response, or subset of responses, is a necessary or sufficient condition for the attribution of emotion. The second is biological, which, in contrast to the first one, suggests that "anger is a residue of our biological past, which under more civilized circumstances we can control only imperfectly" (p. 1146).

The interactions of anger, disgust and contempt and cognitive structures are considered as a personality characteristic or disposition of *hostility* (Izard, 1991). Berkowitz (1962) however believed that aggression and hostility are synonymous terms.

Finally, the term *violence* is similar to aggression but connotes the most severe forms of physical aggression (Martens, 1975b, 1975c). Nevertheless, the main difference between them is that violence is an event whilst aggression is a process (Pooley, 1980).

Several attempts to define aggression have been made by behavioural scientists (Shantz, 1986; Underwood & Whitwood, 1980). One representative definition has been offered by Baron (1977) that is: "*Aggression* is any form of behaviour directed toward the goal of harming or injuring another living being who is motivated to avoid such treatment (p. 7).

Several key points -interspersed in other definitions- are incorporated in Baron's definition (Gill, 1986) which are as follows:

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1. Aggression is *behaviour* and not an attitude, emotion or motive (Johnson, 1972). Therefore, negative thoughts and anger are not aggression, but anger and thoughts might *sometimes* play a role in the occurrence of aggressive behaviour (Gill, 1986; Silva III, 1980).
2. Aggression is directed, intentional behaviour. Therefore, *accidental harm is not aggression* (Underwood & Whitwood, 1980).
3. Aggression is directed against *living beings* (kaufmann, 1970; in Martens, 1975a).
4. Aggression involves *harm or injury* in physical, verbal or symbolical form that may deprive someone of something (Shantz, 1986).
5. Aggression is limited in incidents in which the victim is motivated to *avoid* the aggressive treatment (Gill, 1986).

Another distinction should be made in terms of the direction of aggression, that is, aggressive behaviour directed against the self is labelled intrapunitive behaviour or reaction, while when it is directed against another person(s) it is labelled extrapunitive behaviour or reaction (Husman & Silva III, 1984).

Although the above key points elucidate some definitional ambiguities, further clarification and a definition more close to the sport environment are needed, because an athlete's aggressive behaviour mainly during competition is looked at quite differently by other individuals (Gill, 1986). Thus, athletic aggression has been described as : "the initiation of an attack with the intent to injure within the realm of agonic or competitive physical activity such as sport and athletics" (Alderman, 1974; Bredemeier, 1977, 1980; p. 204). From this definition and according to the primary reinforcement sought via the act, two major forms of aggressive behaviour have been extracted:



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Hostile aggression and instrumental aggression (Buss, 1961; Feshbach, 1964).

*Hostile* or *Goal* or *Reactive Aggression* are terms which researchers (Bredemeier, 1977; Davidson, 1989; Ryan, Williams & Wimer, 1990; Underwood & Whitwood, 1980) have employed in order to describe aggression that is typically assumed to be initiated by insult or attack and its primary reinforcement is the infliction of injury or harm on another person. Berkowitz (1965) has called this type of aggression "*angry aggression*" because the aggressor responds emotionally to an individual perceived as a threatening enemy or frustrating agent (Spielberger et al., 1983). A reactively aggressive athlete may be induced by anger, hostility, frustration or the threat of unpleasantness to injure the opponent. Thus, reactive aggression is an *end* rather than a means. This contact however, may elicit feelings of guilt from the competitor (Bredemeier, 1975; 1977).

*Instrumental Aggression* may be defined as an aggressive act that is thought to be initiated by goal blocking or competition and which also involves an intent to injure. However, the primary reinforcement sought via instrumental aggression is the attainment of a tangible reward such as winning, recognition, or popularity (Alderman, 1974; Bredemeier, 1980; Cratty & Pigott, 1984; Hoving et al., 1979). Instrumental aggression is not a response to a frustrating agent and does not involve anger, thus it is a *means* to an end. According to Bredemeier (1977) an instrumentally aggressive athlete "employs cool objectivity in an attempt to achieve a goal" (p. 136) and for him/her the injurious action is incidental. Moreover, as Davinson (1989) has pointed out, aggressive play is instrumental in achieving goal objects

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in sport by: subjugating the opposition; stopping opposition attacks; applying pressure to points of weakness in the opposition; dominating the opposition in set plays (p. 35).

Nevertheless, whatever the primary reinforcement is, both forms of aggression involve an intent to injure an opponent. Things become more complicated however when physical force in some team or individual sports is involved. Forceful behaviour acceptable by the rules of the sport being played are many times misjudged as injurious aggressive. However, not all forceful behaviour is necessarily aggressive. Thus, it was deemed necessary to provide a definition that can make the distinction between forms of aggressive behaviour which involve the deliberate infliction of pain or injury on someone from those aggressive behaviours where such an intention is absent. According to Husman and Silva III (1984), two main reasons call for this distinction. First, identifying and discriminating aggressive from nonaggressive behaviour, legitimate sanctions can be assigned more accurately to those responsible, and second, some steps in the right direction for control and prevention of aggression can be carried out. Furthermore, they proceeded with the differentiation of aggressive from assertive behaviour.

*Assertive Play* in sport has been conceptualized as heightened physical behaviour that is goal-directed, often involves the use of legitimate physical force, and should be considered "part of sport" (Tenenbaum, Stewart, Singer & Duda, 1997). Husman and Silva (1984, p. 249) noted: "Such behaviour requires unusual energy and effort, which in most other social settings would appear to be aggressive behaviour." Silva (1980) defined such behaviour as *proactive assertion* (offensive

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or defensive), a term which implies that the behaviour is forceful or active yet acceptable because it requires that resolutions for conflict reflect the interests of both self and other, thereby maximizing the potential of moral balance (Bredemeier, 1994).

Many forceful acts are implicit within the nature of certain sports and are indeed legitimated by the rules of the particular sport. Other forceful acts that may not be an accepted part of the sport, are characterized as hostile, coercive acts involving self-expression at the expense of others (Bredemeier, 1994) may be capable of causing harm, and usually do not happen accidentally. Aggressiveness violates moral balance because aggressors seek to impose their will on others and force is used to gain personal advantage or to express frustration or anger at others' expense (Bredemeier, 1994). The basic difference between the behaviour is found in the *intent*, not the intensity of the actions. This means that there is always the possibility that an athlete may exhibit legal behaviour with an underlying intent to cause injury. Differentiating between aggressive and assertive behaviour may sometimes involve subjective inference and consideration of the individual's motives (Connelly, 1988).

### ANGER AND AGGRESSION

Another topic that needs to be discussed is the relationship between anger and aggression. Anger almost always connotes aggressive acts. However, aggression is one way in which anger is *sometimes* expressed (Averill, 1982) and only when the response is directed toward injuring the target. That is to say, while anger would be expected to mediate angry aggression, it would not be expected to underlie an

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aggressive response that served to obtain a goal for purely extrinsic reasons unrelated to the victim's behaviour (Rule & Nesdale, 1976). As Berkowitz (1964) has pointed out "anger is viewed as the emotional state resulting from a frustration presumably *creating a readiness* for aggressive acts" (p. 69). It should be emphasized that there is no evidence of direct connection in either, the nervous system, or at the behavioural level, between anger and aggressive behaviour. What anger can actually do is to mobilize energy which with appropriate regulation and training can be effective for instrumental actions and self-defence. But anger does not necessarily lead to aggression (Izard, 1991).

### MEASUREMENT OF AGGRESSION

The earliest attempts to assess aggression and hostility in the field of psychology were basically based on behavioural ratings and projective techniques<sup>1</sup>. However, because of a number of major problems such as low reliability, limited evidence of validity, and complex scoring system, researchers turned toward the use of self-report scales. In the sport context, measures such as the Minnesota Multiphasic Personality Inventory (MMPI), the Buss-Durkee Hostility Inventory (BDHI), the Edwards Personal Preference Schedule (EPPS) were utilised in many studies by sport psychologists who faithfully followed the tradition of borrowing personality inventories from the field of psychology (Ciccolella, 1978; Ostrow, 1990).

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<sup>1</sup> In the decade of 1950's and 1960's projective techniques were the most widely employed measures (Spielberger et al., 1983). Amongst these techniques, the Thematic Apperception Test (TAT), and the Rosenzweig Picture-Frustration Study (P-F Study) were the ones which also used to measure athletes aggressiveness (Ostrow, 1990; Trichka, 1984).

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In 1975, within sports, the Bredemeier Athletic Aggression Inventory (BAAGI) was developed. This instrument is a two-dimensional instrument designed to assess aggressive tendencies in terms of instrumental and reactive aggression. During the 1980's, the use of sport-specific instruments became more prominent and this tendency became quite apparent by the number of two-dimensional instruments developed for this purpose. However, only a limited number of these measures were suitable for research purposes since their psychometric properties were not available or were not presented. On the other hand, some instruments were designed to measure aggression exhibited in a particular sport setting (e.g. the Aggressive Tendencies in Basketball Questionnaire, by Duda et al.; cited by Ostrow, 1990). Amongst the existing measures, the BAAGI was the instrument suitable for all sports and with satisfactory psychometric properties. For this reason, it was initially intended to utilise this instrument for the present study. More details about the BAAGI are given in the chapter 3, and reasons for adopting an alternative.

### THEORIES OF AGGRESSION

Many people attribute Man's aggressive behaviour to "the nature of Man" or, with regard to aggressive behaviour on playing fields, to the "nature of sport" by reason of the generally held view that physical activities -mainly the vigorous ones- allow people to "let off steam." Cataldi (1980) has noted that this sentiment can be found in various social environs such as : child fostering e.g. justifying the behaviour of an unruly child; in the formulations of government policy; and, in academic circles.

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Scientists on the other hand have studied aggression in order to understand and explain the origins and nature of an aggressive behaviour and give logical answers to general questions such as: "Why do people behave aggressively?", and to more specific ones such as, "Why is aggression so prevalent to sport?" or, whether sport teaches and encourages aggression, or whether it attracts people who are aggressive by nature, etc. (Tandy & Lavin, 1980). As a result, a number of theories have been proposed which fall into three major categories:

1. Instinctive theories;
2. The frustration-aggression hypothesis; and
3. The social learning theory.

*Instinctive or Innate Theories* propose that aggressiveness is a genetic predisposition of all individuals. Instinct theories derive mainly from two sources, that is psychoanalysis and ethology (Goldstein et al., 1981).

*Psychoanalytic Theory* is associated with Freud who suggested that aggression is an instinctive biological urge that gradually builds up and at some point must be released. Sometimes it is released in the form of physical or verbal abuse against another person. At other times the aggressive impulse is turned inward and produces self-punitive actions, even suicide (Bernstein et al., 1994).

The *Ethological Theory* of aggression is in many ways similar to the psychoanalytic. This theory rejects the death instinct but postulates that man has an aggressive or "killer" instinct (Lorenz, 1966). According to Lorenz, since aggressive drive is accumulated within the individual, humans are driven from within to commit

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aggressive acts. Thus, this aggressive energy must find acceptable or constructive outlets such as competitive sports. Simmel (1966) has likened sports to a safety valve which, in "letting off steam", releases the repressed drives preserving other forms of social life from their destructive impact.

Although instinct theories provide the best justification for competitive sports, however, such an analysis is misleading because: "such an assumption leads to misdirected attempts in the control of such behaviour" (Dickinson, 1976, p. 103); they ignore the existence of important factors such as intelligence, the role of learning and the complex interplay between nature and nurture. Later, however, Lorenz (cited by Berkowitz, 1976) has admitted this saying: "we ethologists were mistaken in the past when we made a sharp distinction between 'innate' and 'learned'" (p. 265).

Another theory closely allied with the innate theories of aggression is the *Cathartic Hypothesis*. The catharsis concept is very old and "originated from the Greek katharsis<sup>2</sup> (cleanse or purify) and means to purge the body" (Husman & Silva III, 1984; p. 252). Later this term was associated with aggressiveness (Cataldi, 1980). According to the theory, by encouraging individuals to express their aggression, safe outlets for aggression are provided and the individuals return then to a state of relative calm<sup>3</sup>. Thus, the notion that, participation

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<sup>2</sup>As Goranson (1980) and Goldstein (1979) have pointed out, the concept of catharsis may be attributed to Aristotle, who embodies in his theory of leisure the term catharsis only to the draining off of tragic feelings.

<sup>3</sup>There are many persons who believe that competition can reduce aggressive urges. This belief is based on the mood improvement, because people sometimes feel better after participating in a contest, and they mistakenly

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in sport, in particular in vigorous contact sports (direct), or observing violent behaviour (indirect) results in a reduction of aggressive tendencies of participants (Leith, 1989) and acts as a "safety valve" has dominated. The data however from a number of experimental researches does not give support to the above hypothesis either in the case of direct or indirect participation in sport. In contrast, by watching or participating in aggressive activities, the level of aggression either remains the same or quite frequently increases (Arms, Russell & Sandilands, 1979; Ryan, 1970; etc.).

In short, the above theories seem too simplistic to fully account for human aggression (Martin, 1976). Averill (1993) has pointed out that, for one thing, there are large differences in aggression from culture to culture, thus suggesting that, even if aggressive impulses are universal, the appearance of aggressive behaviour reflects an interplay of nature and nurture (Lore & Schultz, 1993). The implications of these theories for society in general and sport in particular are serious since they imply that aggression cannot be reduced by social reforms, changes in childbearing, or alleviation of frustration and provide justification for violence and aggression in sport (Ciccolella, 1978).

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attribute this improvement in mood to a release of aggressive energies. As Berkowitz (1993) explains, in actuality, people probably are happier because 1) they enjoyed the competition (maybe because they won) and 2) they were so involved in the contest that they stopped thinking about the events that had provoked them, thus stopped stirring themselves up. In either case, aggressive inclinations were no longer activated (Berkowitz, 1993; p. 42).



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*The Frustration-Aggression (F-A) Hypothesis*<sup>4</sup> : Dollard and his associates (1939; in Husman & Silva, 1984) integrated some of the drive concepts of the instinct themes with some learning principles that influence human behaviour. Their basic hypothesis was that frustration that resulted from the blocking of a goal-directed activity was the major cause of excessive anger (Cratty, 1984). The notion of the cathartic effect<sup>5</sup> is prominent in this position. Another important feature of this hypothesis, that is in contrast to instinct theories, is that the motivation to aggress arouses by an external frustration stimulus rather than by an innate force (Goldstein et al., 1981). When an individual's ongoing goal-oriented activity is blocked he/she will produce activities in order to injure the frustrating agent (Lefebvre & Passer, 1974). This hypothesis had two important effects on people's thinking, that (a) frustration always leads to aggression, and (b) aggression always stems from frustration (Bredemeier, 1980; Gill, 1986). Miller (1941), however, one of Dollard's associates, admitted that not all frustration resulted in aggression and that frustration was a trigger cue to aggress and not necessarily the cause of aggression. He also pointed out that aggression could be unobserved (verbal, fantasy or implied aggression) (Martens, 1975a).

Cratty (1981) has pointed out that, according to the supporters of F-A hypothesis all competitive behaviour will (inevitably) lead to

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<sup>4</sup>The F-A hypothesis has also been termed *Circular Theory of Aggression* because, as the supporters of the theory anticipated, (the fear of) punishment could lead to more frustration which causes aggression which causes guilt and leads to more frustration and thus to more aggression (Husman, 1980; Husman & Silva III, 1984).

<sup>5</sup>The expression of any act of aggression is a catharsis that reduces the instigation to all other acts of aggression (Martens, 1975a).

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aggression because: in competitive situations all cannot win; the losers experience frustration at not meeting their expected goal; thus, this frustration leads to aggression.

The aforementioned hypothesis initiated a number of studies (e.g. Davitz, 1952) which, however, did reveal some serious flaws. For instance, the results demonstrated that the effects of frustration depend on individual's past learning experience and more importantly, frustration may elicit responses other than aggression e.g. regression (Alderman, 1974; Berkowitz, 1962). Findings of this line of research have apparent relevance for sport, because they have contributed much insight into the phenomenon of catharsis, by identifying factors which lessen the inevitability of aggressive reaction to frustration.

Another approach which has been adopted by psychologists to account for the aggressive behaviour is the *Social Learning Theory*. This theory evolved from the realization that aggression is a learned behaviour. Specifically, the main factor that has influenced the shift from a psychodynamic view of human behaviour to the social learning view is the large number of experimental studies. Results of these studies have demonstrated that many significant human behaviour can be strengthened or eliminated through the manipulation of specific social influences (Goldstein et al., 1981).

Looking more closely at the relationship between the external environment and various aspects of human behaviour, social learning theorists led to the conclusion that aggressive behaviour can be acquired in the same manner as all other behaviour. However, to say that aggression is acquired and manipulated through experience, either

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direct or observational, is not to deny that "biological structure obviously sets limits on the types of aggressive responses that can be successfully perfected, and genetic endowment influences the rate at which learning progresses" (p. 44) (Bandura, 1973, 1983).

Two important features of social learning theory must be highlighted. First, the individual is seen as influencing his own behaviour through a number of important cognitive processes. Secondly, behaviour change is seen as part of a reciprocal interaction between behaviour and its controlling condition. This means that, not only behaviour partly creates the environment but the resultant environment, in turn, affects behaviour. Thus, in this two-way causal process the individual helps shape the environment that subsequently influences his/her behaviour (Bandura, 1973; Goldstein et al., 1981).

For the social learning theorists, the learning of aggression is achieved by two ways: through *observational (vicarious) learning* and through *direct reinforcement*. A reinforcer is an event that increases the frequency of any behaviour which it follows and can be either positive or negative (Goldstein et al., 1981)<sup>6</sup>.

In sports in particular many aggressive behaviours are encouraged and maintained through the vicarious and direct reinforcement. Silva III (1984) summarizes the factors that seems to influence the acquisition of behaviour via vicarious processes, which are: a) the characteristics of the performer, b) the value of reward or the intensity of punishment, c) the similarity between the observed

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<sup>6</sup>A reinforcer is referred to as positive when an event following a behaviour increases the frequency of the behaviour. In contrast, a reinforcer can be negative when the removal of an event following a behaviour increases the frequency of the behaviour (Goldstein et al., 1981).

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environment and the environment to the potential performance by the observer, and d) the status of the model. Thus, for instance, when a young athlete observes another (mainly young) athlete (peer, idol) (or even professional coach) displaying aggressive behaviour that is rewarded by significant others approval, or from the media or gaining a tactical advantage with no or minimal punishment, then the observed reward<sup>1</sup> has a motivational effect on this athlete. This means that the rewarding aggressive behaviour can encourage the development and exhibition of similar behaviours by the observer of the act.

Leith (1982) offers a categorization of reinforcers that, according to him, control almost all aggression behaviour in the sport environment. These are:

- **Social reinforcers**, that would include praise, affection, social approval, encouragement, attention, adult proximity and their reinforcement strength would depend upon each individual's reinforcement history.
- **Intrinsic information reinforcers**, that refers to sensation arising from the bodily contact through kinesthetic feedback, such as the "feel" of a body-check, tackle, etc. From the given examples however, seems that this type of reinforcers does not apply to non-contact sport athletes, unless Leith means that the "feel" of

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<sup>1</sup>Bandura (1973) identified external rewards which are functional in many sports. These are: a) Tangible reward, such as intimidation of an opponent, tactical advantage, monetary gain etc.; b) Status reward, by gaining verbal praise from significant others and establishing oneself in the team; c) Expression of injury, that is, infliction of injury may inhibit further aggression in some cases while in some others it may escalate aggression; d) Alleviation of aversive treatment is a type of "defensive aggression" and can be self-reinforcement behaviour, because it not only stops the aversive treatment but may reduce its occurrence in the future. In addition, the gained advantages/rewards establish a style of play for the team or for the individual athlete (Silva III, 1984).

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exchanging aggressive glances between opponents for instance, produces the sensation of kinesthetic feedback.

- **Internal reinforcers**, which are a) vicarious, and b) self-control reinforcement, and
- **Material reinforcers**, which involve tangible rewards such as prizes, money, awards etc. However, a tangible reward might be highly reinforcing to one athlete but completely ineffective to another.

Bandura and his associates have exhaustively reviewed the effects of learning that are associated with aggression (Bandura & Walters, 1963) and supported this theory by their studies based mainly on children (Bandura, 1965). Of course, individual differences in temperament, the modeling of nonaggressive behaviours by parents, and other factors can temper the effects of vicarious learning; not everyone who sees aggression becomes aggressive. Nevertheless, observational learning does play a significant role in the development and display of aggressive behaviour (Baron & Richardson, 1992).

At the present time social learning theory appears to have the most practical implications for sport, especially when considered in light of Bandura's (1979) statement. "People can acquire, retain, and possess the capability to act aggressively, but the capacity may rarely be expressed if it has no functional value for them or is negatively sanctioned" (p. 203). The encouragement of aggressive behaviour contributes to development of a personality disposition which facilitates further aggression. If athletes who are aggressive in their sport are reinforced for their aggression, it makes them more rather less aggressive (Alderman, 1974). On the other hand, seeing such behaviour exhibited and rewarded in sport settings can lead the

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observer to exhibit similar behaviour. According to the Social learning paradigm, styles of aggression are learned through observation and refined through reinforced practice. This is especially true when the violation of rules meets with approval and success (Husman & Silva III, 1984).

Sport is a social institution in which behaviours are demonstrated and learned within the sport environment (Connelly, 1988). Sport, therefore, may provide the setting for acquiring undesirable behaviours (Bernstein et al., 1994). Immediate reward or punishment can also alter the frequency of aggressive acts. A person's accumulated experiences, including culturally transmitted teachings, combine with the rewards and punishments operating daily within the environment to influence whether, when, and how aggressive acts occur (Baron & Richardson, 1992). Application of social learning theory suggests that the sport realm may also provide a setting for learning assertive behaviours (Connelly, 1988). If aggressive behaviour is learned, then, non-aggressive behaviour can be learned in the same way. This contention supported by the study of Wandzilak et al. (1988) which was conducted during a 9-week basketball season to determine the effectiveness of a values-related model in producing changes in the moral reasoning, sportsmanship perceptions, and behaviour of male junior, high school basketball players. Comparison of pre- and post-season mean scores and analysis of the behaviour patterns of players suggest that for the experiment group a sportsmanlike pattern was emerged.

Although the research presented conclusive evidence (Raviv, 1980) which supported social learning theory this has, nevertheless, been

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criticized (Perry, 1989) for limitations (Smith, 1974) such as:

1. Because most of the findings come from research which is based on children's responses, it was called into question whether these results can be generalized to older children or adults.
2. It is not clear how long-lasting the effects are of exposure to aggressive models.
3. Sears (1965) has characterized the imitated responses in the Bandura experiments as simple and easily recognized and concluded that more complex behaviour may not be learned by modeling.
4. Social learning theory does not adequately address why some people follow the lead of models, whereas others do not, nor does it adequately explain why some people remain highly resistant to changing environmental contingencies (Stephens & Bredemeier, 1996).

Another theoretical view was put forward by Berkowitz (1965) who adopted some of Dollard et al's ideas and formulated the proposition that *learning* and *innate*<sup>8</sup> sources of aggression *coexist* in man and that learning can modify the responses to frustration. Berkowitz (1969) also believes that frustration arouses an emotional state, which can be anger and this anger creates a readiness for aggression. He further hypothesizes that an individual can avoid aggression after frustration if: it has learned a non-aggressive response to that condition; and/or the target has inappropriate stimulus qualities.

Another important point in Berkowitz's reformulation is that he attributes the occurrence of aggression to more than one reason

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<sup>8</sup> "An innate predisposition should not be equated with an instinct, an instinct is not modifiable by learning" (Martens, 1975a, p. 116).

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including: a) frustration of goal directed behaviour; b) learning aggressive behaviour to certain stimuli; and c) pain, because it increases arousal which increases the probability of aggressive responses (Martens, 1975).

Berkowitz conducted a number of experiments on filmed violence. His findings, which have apparent relevance to sport, illustrated that the volume of aggression is related to a specific target. Also, the aggressive responses which are evoked from the presence of disliked persons are stronger than those of neutral persons (Berkowitz, 1976). Then Berkowitz examined several situational factors which elicit aggression. He found that these factors often exert influence on aggressive behaviour, e.g. the presence of aggressive weapons, aggressive words, etc. (Berkowitz, 1976; Berkowitz & LePage, 1967).

In the study of aggression some other theories have been proposed. Recently, Geen (1990) proposed for a *broadening of F-A hypothesis* which would assert that "any significant change for the worse in a person's situation may be sufficiently aversive to cause increased stress and arousal, and that the arousal thus engendered may activate and energize aggressive responses if these responses are highly probable in the situation" (p. 38) (e.g. sport situation). One advantage of broadening the hypothesis in this way is that it can, in its revised form, account for aggression caused by a wider range of antecedents, such as environmental conditions or physical pain, or situations involving interpersonal attack and provocation (Geen, 1990).

Another theory which has followed an approach similar to the frustration-aggression hypothesis has been the *Discrepancy Theory*



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(Archer, 1976) and a physiological approach, such as the *Physiological Theory* (Moyer, 1976). Also, another *Social Learning Theory* was presented in 1965 by Mosher, who has noted that observation and experience function as signals of "stop" and "go" into social environment which influence personal expectations, the value of reinforcement as well as the personal and social inhibitions of behaviour. Since it is beyond the scope of this thesis to review all the existing theories of aggression but only those that have closely connected with sport, for more details on these theories the interested reader is directed to references cited above.

Today, assessment of aggression is based on a multi-perspective view which has found considerable support (Bernstein et al., 1994; Geen, 1990; Segall, 1983) and which has been summarized by Pilz as follows: "... the human being is provided with genetic patterns or possibilities for certain definite ways of acting. Whether or not such definite behaviour appears is not bound to a fateful instinct but depends on a specific relationship of genetic possibilities as well as situation and socio-cultural facts. It follows that behavior, as far as violence and aggression are concerned, is "the result of interplay between experience and the pattern of genetic possibilities" (Wilson, 1976, p. 344). The significance of the various factors is specifically dependent upon the social stratification of the society, culture, and situation. On the other hand it varies from one type of aggressive behaviour to another" (Pilz, 1979; p. 8).

### MODEL OF ATHLETES' AGGRESSION TYPES

The observation that within sports young competitors exhibited poor behaviour was of increasing concern to the Institute of Child Health (London) and the Sport Council. The Training of Young Athletes (TOYA) study was a multi-national project which aimed to investigate children's fair and foul play. Hodgson (1989, 1990, 1991) proposed a

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new model of aggression types. He taking into consideration the definitional problem that exists in aggression literature, attempted to construct a model for understanding the diversity of aggression in sport. For this purpose, a large number of athletes were interviewed with regard to their perception and ideas about aggression not only in sport but also in their every-day life.

The subjects were young, successful, intensively trained athletes aged 9 to 18 years old in four sports: football, gymnastics, swimming, and tennis. The questions which young athletes were asked were: "Are you aggressive a) in sport and b) in everyday life?"; "What exactly do you mean by aggression in sport and in general?"; "Do you want to change (improve on) your aggression in sport?"; "if so, how?" The answers of athletes were analysed, and a new model of aggression types emerged (Figure 2.1).

**Figure 2.1 : Model of Aggression Types (Adapted from Hodgson, 1990)**

|          | Honest                                       | Cynical  | Angry                                      |
|----------|--|--|--|
| Mental   | Determined<br>"Single-minded<br>will to win" | Cheating<br>"Winning at all<br>costs"          | Anger<br>"Annoyed with<br>self"            |
| Verbal   | Assertive<br>"Stands firm on<br>rights"      | Manipulating<br>"Gets others<br>psyched out"   | Arguing<br>"Loses temper<br>with others"   |
| Physical | Commitment<br>"Gives 100%<br>effort"         | Intimidation<br>"Going out to<br>hurt someone" | Retaliation<br>"Reacting with<br>violence" |

According to this model, three types of aggression were identified: Honest, Cynical, Angry aggression. As can be seen by Figure 2.1, all three types were expressed in the Mental, Verbal or Physical

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form of aggression.

*Honest Aggression* : In a sense, **assertive behaviour** or **proactive assertion** and **honest aggression** are of the same quality. According to Hodgson (1989), the main characteristic of honest aggression is that it is positive and non-threatening. There is by no means an intention to harm or upset anybody. Moreover, qualities in the honest category, as they were described by athletes, are **Mental Determination**, **Verbal assertiveness** and **Physical Commitment**. The types of athletic aggression with examples are illustrated in Figure 2.1.

*Cynical Aggression* is the behaviour exhibited by the athlete who choose not to compete fairly. It is cool and calculated, and as Hodgson (1989) has pointed out "this is instrumental behaviour in the sense that there is an intent to use others in an attempt to get a desired effect" (p. 35). This type of aggression is negative but is not characterized by the element of personal attack on others. Instead, it is seen as very functional to sporting success. Upsetting or harming others is therefore a necessary by-product of achieving one's goal. Qualities of cynical aggression referred to were: **Mentally Dominating**, **Verbally Manipulating**, or **Physically Intimidating**.

It could be argued here that, if we are to use the term "cynical" in its strict sense, it might cause confusion as to what is the exact meaning. According to the Oxford dictionary (Hornby, 1974), cynical or cynic, is the person who sees little or no good in anything, has no belief in human progress and shows this by being sarcastic. But, being sarcastic does not signify that the person will resort to physical aggression in order to achieve his goal, as the physical sub-type of cynical aggression implies. On the other hand, in its loose use the

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term might be construed as harmful behaviour. Calculated, cool, or intimidating aggression would be perhaps a more illuminative term for this type of aggression.

Another differentiation of aggression that seems also to be appropriate is the one offered by Buss (1971) and Rule and Nesdale (1976). According to them, rather than distinguishing between hostile and instrumental (angry -see next paragraph- and cynical in our case) aggression, it might be more suitable to draw the distinction between angry and non-angry aggression with the former type encompassing those responses induced by anger and the latter aggressive responses that serve extrinsic goals.

*Angry Aggression* is negative but emotional and reactive. This type of aggression may be more obviously undesirable behaviour, which tends to be personal, not functional, and therefore detrimental for the athletes' performance. As mentioned by some athletes, the energy that the emotion of anger releases is very useful for their performance, if it can be channelled and controlled. The qualities of angry aggression were experienced as **feeling Angry, arguing, and physically retaliating.**

Hodgson (1990) has noted three reasons which make athletes behave aggressively. These are as follows:

1. **Psychological**, which are based on athletes' (poor) judgments regarding intentions of others. When athletes deal with aggression they must make their choice in judging an incident to be honest, cynical (deliberate) or angry (retaliatory). Athletes behaviour then varies according to their choice of judgment. When they perceive aggression as cynical and then respond with their own angry aggression, this can escalate further aggressive exchanges, especially when misjudgment has

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taken place about the opponent's intentions. Therefore, the important point is athletes' judgements about others' intentions. It is also important to note that referees also constantly make these kinds of judgments, which in turn may affect athletes' behaviour on both sides.

2. **Emotional**, when athletes are unable to control their emotions and react aggressively when faced with provocation. They may not have problems in accurately judging someone's cynical intentions but they react angrily because they cannot attain self-control.

3. **Moral**, when athletes choose cynical aggression in getting the desirable outcome. This does not mean that they cannot control their angry aggression. Simply, this form of aggression reflects their values and beliefs about the way they prefer to "play the game". In other words, they prefer not to play fairly.

Moral judgements are involved with all types of aggression, calling into question whether a particular expression and type of aggression is justified or acceptable. It should be noted however that moral judgements are more often involved with issues of cynical aggression than with the other aggression types. Moral judgements for the three types of aggression are illustrated in the following examples (Hodgson, 1989):

- **Honest aggression** : "okay, it was an honest attempt to go for the ball but he was wrong to do it because he should have realised how likely he was to injure the player."
- **Cynical aggression** : "okay, it's useful to upset your opponent's concentration by talking to him between games, but it was wrong to mention the player's mother."
- **Angry aggression** : "... a footballer told about a time he got so

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frustrated at an opponent's continual kicking that he took the law into his own hands and angrily, physically retaliated. Normally he claimed he never did such things but he had to this time because the referee was not taking care of the situation for him" (p. 36).

With regard to angry aggression, there is in fact considerable evidence that (for both adults and children) aversive treatment elicits maximum hostility and dislike, when it is viewed as unfair and unjustified, and that dislike may in turn be related to physical aggression (Shantz, 1986). Research findings have also shown that conditions which are assumed to induce anger increase only angry responses and not responses that would serve other goals (Rule & Nesdale, 1976), cynical for instance.

Further, patterns regarding general and sport aggression of those athletes who participated in the project were reported by Hodgson (1989) in the form of trends. With respect to general aggression, the majority of athletes (80%) reported that they were not aggressive in everyday life. This is not surprising, both moral reasoning and action tendencies may be influenced by the context in which they occur. Play, games and sport are important socializing contexts that frequently have been described as conceptually and emotionally distinct from everyday life. Bredemeier and Shields (1986) and Shields and Bredemeier (1995) have offered theoretical and empirical support for the contention that, reasoning about moral issues set in sport specific contexts is organized more egocentrically than in moral reasoning about issues in daily life settings. It may be that people's action tendencies also change when they enter the sport realm. Thus, aggressiveness may be valued by some athletes or coaches on the playing field, but disavowed

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elsewhere (Bredemeier, 1994). Furthermore, footballers tended to employ the physical form of cynical aggression. Tennis girls on the other hand tended to be more cynical in verbal terms whereas tennis boys were more angry without expressing a particular form of aggression.

As regard sport aggression, trends indicated that the physical form of aggression was entirely employed by footballers while tennis players of both sexes employed equally mental or physical aggression. Gender differences with regard to the type of aggression were apparent with females (tennis players) seeing aggression in sport as honest, whereas football and tennis boys, although defining it as honest, recognised some cynical and angry aggression in their sport.

What is interesting however is that the majority of athletes said that they wanted to increase their honest aggression, and only a few wanted to be more cynical. As regards athletes who were high in angry aggression (10-15%), they reported that they wanted to decrease this type of aggression in their sport.

The above model seemed to be an interesting and promising one because it allows for important distinctions between the types of aggression described. Moreover, since no single definition of aggression is used, it can cover a wider range of problems an athlete faces. In addition, as it accounts for all main types of athletic aggression, it provides the clearest picture of the many aspects of athletes' aggression and allows for a more accurate estimation of them. Since this model seemed to offer a better understanding of athletes aggression, its application was decided for the present study.

However, in spite of its merits, the aforementioned model is not free of weaknesses. The definitional problem with the introduction of

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the honest and cynical type of aggression has already been noted. Apart from that some other weaknesses will be discussed below briefly.

One of the serious ones is that, as far as the author knows, Hodgson has not presented evidence for the validity of his model, although he stated that the model has been validated. No other evidence regarding the psychological properties of the model have been reported. Moreover, the model has not been tested empirically.

Another omission is that Hodgson has not discussed whether the main types of aggression are conceptually independent or if they covary in different competitive situations. Furthermore, no mention has been made of whether the three subtypes, mental, verbal, physical of each aggression type (honest, cynical, angry) interact within an individual. In addition, other questions as, how situational factors such as sport type, and intrapersonal factors/individual differences variables such as age, experience relate to three aggressive types and their subtypes, or, which are the potential antecedents of aggression types, are awaiting for an answer.

It should also be kept in mind that this model emerged from responses given by athletes ranged in age from 9 to 18 years old. Therefore, it is necessary to test the model with older athletes. Nevertheless, the application of such a model for the measurement of aggression types described above required a research tool suitable for this purpose. To meet this requirement, the development of a new measure of aggression based on this model was decided. The procedure for the construction of this measure is described in a great detail in chapter 3 (study I).



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### RELATIONSHIP BETWEEN ATHLETIC AGGRESSION TYPES AND OTHER FACTORS

#### 2.1.1. SPORT CATEGORY

It has been suggested by coaches and athletes that, sometimes negative or even hostile feelings about an opponent can serve as strong motivational factors for victory. These feelings can be created if opponents are perceived as enemies. Although it could be held true for athletes of all types of sport, this is especially the case for contact sport athletes who may sometimes build up these intense feelings and transfer them into action. As some of the contact sport athletes stated, building up an intense hatred for an opponent, enables them to brutalize, intimidate or injure him/her (Silva III & Weinberg, 1984). Their statements further implied that it is the "nature" of sport that gives athletes the "opportunity" to act in this way. Consequently, physical contact is viewed as the main catalyst for aggressive actions.

This viewpoint has been supported by a number of studies. According to Gaskell and Pearton's (1977) observation, athletes exhibited a greater amount of aggression as physical contact increased. Brown and Davies's (1978) attitudinal data has also indicated that male athletes of contact sport teams scored significantly higher on an attitude toward violence scale than did male non-contact sport athletes. In a follow-up study, Brown (1982; in Silva III, 1984) found that both male and female college athletes who participated in contact sports were more willing to use aggression in sports than were athletes who rarely participated in contact sports.

A similar observation has been made by Silva III (1983) who examined the influence of social psychological factors on the perceived legitimacy of rule violating behaviour. His findings, as well as those

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of other researchers such as Vaz (1974), give support to the social learning theory. He found that the acceptance of aggressive behaviour by males increased as the amount of contact in their sports as well as the number of years they played organized sport and the level of organized sport attained increased too (Rainey, 1986).

Vaz (1974) has shown empirically that violent behaviour is learned by sporting socialization in ice hockey careers. With increasing experience of the game and higher degree of performance, the preparedness to aggressive actions increases accordingly. The techniques of aggressive behaviour under this influence are learned, legitimated and reinforced by the reference groups. Smith (1972, p. 102) argued:

"... that much of violence in sport is the product of socialization. Owing to widespread approval of violence in sport, together with the prevalence of violent role models, violent techniques and attitudes are socially learned, reinforced, and legitimated. And as previously mentioned, where there is a climate of legitime violence, illegitime violence typically flourishes".

Smith's contention is supported by Tittel, Schaetz and Hagen's (1974) study which demonstrated that such attitudes towards violence in sports are reflected in the sporting situation. Specifically, they showed that 62.9% of injuries of male handball players and 41.3% of injuries of female handball players are the consequence of conscious violation of rules. McCarthy and Kelly (1978) have come to the same results. The cynical statements/comments of players such as those of the German professional soccer player, "We do not much differ from animals. We carry out our struggle for existence with all means. Each one must try to execute the other one" speak clearly for the situation itself. These also indicate that far from being a channel for harmless aggression, today's sport at high competition level legitimates,

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requires, and promotes aggression as normal and inevitable behaviour necessary for success in highly skilled sportsmen and sportswomen (Pilz, 1979). As Weinberg and Gould (1995) have noted, it is not news that a primary focus on winning and beating an opponent can produce hostility and aggression among teams especially between players of contact and collision sports. Therefore, it is not sport or the competition per se which produce the aggressive behaviours and hostility. Rather the focus on doing whatever it takes to win, including unfair play or injuring an opponent is responsible for aggressive behaviour (Weinberg & Gould, 1995). The increasing importance of a required performance or winning initiates a vicious circle by promoting an informal norm structure that pushes the limits of accepted violence higher and higher. This in turn forces back the attenuation of violence more and more and encourages and legitimates open aggression more frequently (Pilz, 1979). Moreover, there was a similar trend by female participants but only at the higher levels of competition or by those involved in a combination of contact-collision sports.

Bredemeier et al. (1986) have also reported that in their study with children, both males and females, who had more experience in contact sports, described themselves as more physically aggressive in sport and in every day life. Their findings are quite comparable to studies which employed adult subjects.

A comment is in order here. Hatred and hostility is not generated only between teams, but also between teammates. Two teammates competing for a starting position might develop hostility and try to undermine each other's play and might lead to one competitor deliberately

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injuring another. These examples illustrate that aggression can equally be developed between teammates and individual sport athletes (Weinberg & Gould, 1995).

Numerous observations suggest that the group is capable of far greater aggression than the individual (Bandura, 1973; Jaffe et al., 1981). Existing studies in social psychology comparing group and individual aggression (Jaffe & Yinon, 1979) provide a clear demonstration that groups tend to retaliate with more physical severity than individuals. In a more recent study of Jaffe et al. (1981) physical aggression, its escalation, and felt responsibility for it, were compared in group and individual action of Israel natives and of European Russian, Caucasian, and Georgian new immigrants to Israel. Generally, the results demonstrated that aggression was greater and escalated faster, and felt responsibility was lower, in groups than in individuals. The explanation given by Jaffe et al. (1981) for the results was the diffusion of responsibility, as a disinhibitor of aggressive behaviour, in groups as opposed to individual conditions where responsibility cannot be shared or diffused.

With regard to the sport realm, to the author's knowledge, attempts to examine aggression between individual and team sport athletes have only been made at the trait level. Theorists such as Olgivie (1968) suggested that certain personality traits (e.g. aggression, dominance) are exhibited by those who retain their motivation for sport competition (Malumphy, 1968; Ogilvie & Tutko, 1964; in Gaskell & Pearton, 1979). Hypotheses such as athletes differ from non-athletes, individual sport participants differ from the team sport participants, formed the basis for the research efforts of some

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sport psychologists. Specifically, research was mainly focused on the relationship between athletic performance and specific personality traits such as aggression, and anxiety.

Morgan (1974) noted that Booth (1958) studied differences between individual and team sport varsity athletes. On the basis of Minnesota Multiphasic Personality Inventory (MMPI) he found that individual sport athletes were more depressed than team sport athletes. In a study conducted by Singer (1969) baseball and tennis players were employed. They were administered the Edwards Personal Preference Schedule, a personality test which among others measures aggressiveness. According to the results significant differences were found with traits such as achievement (to do one's best), intraception (to analyze others), and dominance (leader). In another study, Schrekengast (1968; in O'Connor & Webb, 1976) investigated the personality traits of undergraduate college women (varsity winners). He found that heterosexuality was the only trait that differentiated individual and team sport athletes. This line of research, however, suffers from a number of methodological problems such as questionable sampling techniques, inappropriate statistical analyses etc., and thus no valid conclusion can be reached (Martens, 1975b). Therefore, findings of these studies cannot form the basis for the hypotheses of this study.

**Hypothesis 2.1.1 :** Bearing existing research findings in mind, it is hypothesized that a) contact sport athletes will exhibit higher levels of cynical and angry aggression than non-contact sport athletes; b) as regards individual and team sport athletes, no a priori conclusion can be formulated since it seems difficult to state whether the former or the latter will be higher in honest, cynical or angry aggression.

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### 2.1.2. GENDER

Since history began, different psychological and emotional characteristics have been assigned to men and women (Tarrier & Gomes, 1981). The issue of gender<sup>9</sup> differences has always attracted general interest and in more recent times has been extensively researched. With regard to experience and expression of aggressive tendencies in the sport context this subject has been approached by two different directions, the biological or physiological and the social.

*Physiological Approach* : According to this approach, gender differences in aggression were partly attributed to biochemical factors and specifically to male (testosterone) and female (estrogen and progesterone) hormones. Advocates of this approach based their theses on experimental studies mainly conducted with animals which showed that the male hormone testosterone has some association with aggressive behaviour (Birrell, 1983; Ciccolella, 1978; Izard, 1991).

Research with humans is limited because of the ethical questions raised by the manipulation of human hormones. In their study with varsity college hockey players, Scaramella and Brown (1978) found that a positive correlation exists between the degree of aggressive responses and serum testosterone. In contrast, research findings with girls with hermaphroditic syndromes indicated that these girls were not more aggressive than other hormonally normal girls (Money & Erhardt,

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<sup>9</sup>According to Deaux (1985), sex refers to the biologically based categories of male and female, and gender refers to the psychological features frequently associated with these biological states. Within the sport psychology the focus is usually on social psychological aspects of personality and behaviour and thus gender is the term typically used to refer to those characteristics. There is however some piece of research that does consider the relationship of sex differences to personality and behaviour (e.g. the work of Maccoby and Jacklin, 1974).

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1972). Thus, it appears that results from these findings and other studies (Moyer, 1976; Thomas, 1974) cannot fully explain gender differences in aggression in both everyday life and sports (Birrell, 1983).

*The Social Approach* : The social approach in the study of aggression concentrated mainly on cross-cultural studies, which suggest that certain traits are more characteristic of men and others more characteristic of women. For example, men are often said to be more aggressive than women, and women are often said to be more emotional than men (Williams et al., 1981). Moreover, there was considerable variability across cultures regarding the extent of these differences (Maccoby & Jacklin, 1974; Tieger, 1980).

The groups of psychological traits which have been attributed to men and women in a given country are defined as the sex-trait stereotypes for that country (Tarrier & Gomes, 1981). As Best et al. (1977) commented, sex-trait stereotypes provide psychological justification for the more general sex-role stereotypes, and by extension about the appropriateness of various activities and behaviours for men and women. In a study conducted by Williams et al. (1981), the association of certain male - female psychological traits were studied amongst 5- and 8- years old children in 5 European countries. The findings indicated substantial cross-national similarity in the traits ascribed to men and women.

The generality of findings was not unexpected and provides additional evidence that there is considerable agreement across countries in the psychological characteristics which are differentially ascribed to men and women. Moreover, in a study conducted by Tarrier

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and Gomes (1981) it was found that the knowledge of sex-trait stereotypes is obtained gradually with age. Eron (1980) reported that a host of factors influences children's aggression. For females these include masculine interests, exposure to contact sports, on television, seeing television as realistic, masculine behaviours on the part of a model, and fantasies about actions. For males, too, aggression is predicted by a preference for traditional activities and exposure to a model engaging in masculine activities, as well as by aggressive fantasies, and exposure to televised violence (White, 1983).

These findings are in contrast with the traditional argument that if an observation is fairly universal it provides evidence for a biological base for observed sex differences in aggression. Minturn and Guthrie (1978) report that they found a systematic bias in reports concerning sex differences in aggression. More specifically, when sex differences in the frequency of aggressive behaviour in children is high the differences are reported but when the frequency is low the data tend not to be reported. This is also the case with regard to sex differences on the reward and punishment children receive for aggressive behaviour. In a cross-cultural study of 78 societies, sex differences in styles and targets of aggression rather than in the amount were found (White, 1983). White noted that the roles women and men are assigned are crucial to understanding this difference. Similarly, Rohner (1976) reviewed ethnographic studies that suggest that boys who had "feminine" tasks to perform are less aggressive than boys with "masculine" task assignments. However, those boys with feminine tasks were still more aggressive than girls who did feminine work. Thus, he concluded that "males have a greater constitutional



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readiness than females to behave aggressively, but aggression is subject in both sexes to substantial social control (p. 66)." He argued for a phylogenetic perspective on sex differences in aggression that stated that males have a phylogenetically acquired predisposition for aggression that interact with experience, especially *cultural learning* through enculturation. Deluty's (1981, 1983) data suggest that boys have a greater tendency to aggress than girls do, a pattern that is well established in the aggression literature. Deluty found, however, irregular gender differences in assertion and submission.

In order to explore the sex and environmental contingencies interactive effects on subjects' aggressive behaviour Landau et al. (1973) conducted an experiment with a group of males and females. They found that while both males and females responded in a comparable manner to the friendly programme, there were clear differences in their response to the punitive program. Specifically, males were more punitive than females and that females were much more likely than males to ignore the punitive programme.

Although these differences between men and women reflect those which exist in other social contexts, these are not necessarily comparable to sport settings. The distinctive point is that in sport such behaviour is perceived as legal and normative and thus acceptable. Eron (1980) suggested that girls are conditioned to express aggression in only a few acceptable ways, and sport is one of them. According to Frodi et al. (1977), males are more aggressive only under certain circumstances. Females on the other hand act aggressively only when they see the situation as permitting them to behave aggressive or indirectly. As Fraczek (1985) has noted, "appropriate norms and standards constitute a frame of reference for the process of aggression

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socialization. The regulative norms determine expectations not only for the behaviour of particular individuals under particular circumstances but also for the consequences of their behaviour", for example, fighting for boys and girls (Fraczek, 1985). Bredemeier (1975; 1977) and Berlin (1974) suggested that this is due to women's socialized behaviour in life and sport which is more strongly related to indirect than direct hostility. However, as Frodi et al. (1977) concluded, these differences are not so pronounced as originally believed and also that in a provoked situation no differences in aggression between men and women were demonstrated.

In the sport context, Silva III (1983) tested the hypothesis that social psychological variables influence the perceived legitimacy of rule violating sport behaviour. He found that males see aggression in sport as more legitimate than females. In addition, in a competitive environment, males more readily socialize other males to accept rule violating behaviour. Similar were the results from a research on the legitimacy of aggressive sport behaviour conducted by Brown (1982; in Silva III, 1984). He found that male college athletes were more willing to use aggression than did female athletes.

Bredemeier (1985) examined the relationship between perceived legitimacy of aggressive sport behaviour and moral reasoning with basketball players. The research findings were in accord with those reported by Silva III (1983). Male athletes of this study accepted a greater number of aggressive actions as legitimate compared to female athletes. In 1977, Bredemeier initiated a research project in order to examine the relationship between the two forms (instrumental, reactive) of aggression and participation in specific sport areas. Subjects were female (1975, 1977) and male (1977) football players. The results

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showed that females in 1977 scored significantly higher in terms of reactive aggression and lower in instrumental aggression than subjects tested in 1975. However, females scores in instrumental aggression were higher than in reactive aggression in each sport area. On the other hand, while males expressed similar levels of both forms of aggression, their reactive score was significantly higher than any female sport group's score and than the total score of females in reactive aggression (Bredemeier, 1977). However, as Gill (1986) has noted, the gender differences that may exist are not very meaningful, since there are research findings which demonstrate that experience or training may alter these differences.

Furthermore, some researchers suggest that gender differences in aggression may decrease with changes in society. As, Gill (1986) stressed "the changing roles of women in sport and the increasing presence of females in highly competitive, aggressive sports may be changing gender differences in aggressive sport behaviour quite dramatically" (p. 203). This view has found support from a study conducted by Ciccolella (1978) who examined differences in aggression between male and female varsity athletes. According to the results, female varsity athletes were more aggressive than male athletes.

**Hypothesis 2.1.2 :** Although the research findings are not conclusive as far as gender differences in aggression are concerned, the general trends indicated that differences do exist. Thus, it is hypothesized that there will be significant gender differences in terms of the three aggression types and across sport categories. In particular, it will be expected that females will hold higher levels of honest aggression than males but lower levels in cynical and angry aggression than males.

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As it has been already noted the present study was carried out in a Greek cultural setting. Moreover, for the development of the AAI, Greek athletes' aggressive experiences were utilized. Thus, it is worth illustrating the influence of culture on its members in general, and by extension, on aggressive behaviour and sport in particular.

### CULTURE

The human genetic code does not contain specific instructions how to behave in a particular way. Humans rely for their survival on behaviour patterns which are learned. In sociological terminology, they must learn the "culture" of the society (Bernstein et al., 1994).

More specifically, culture is a "design for living," the accumulation of values, rules of behaviour, forms of expression, and the like for a group of people who share a common language and environment (Triandis, Kurowski & Gelfand, 1993) and transmit these values from generation to generation (Matsumoto, 1989). Culture is often associated with a particular country and allows people to understand and anticipate the behaviour of others in that country (Munroe & Munroe, 1994). In fact, the definition of *accepted ways* of behaving vary from society to society. This can lead to considerable misunderstanding between members of different societies. Examples which sociologists and anthropologists offer illustrate the point. For instance, many of the customs of non-western societies appear strange to Westerners, but in the context of the particular society, they are sensible, rational and an accepted part of life (Haralambos & Holborn, 1991). As an organizing and stabilizing influence, culture not only encourages or discourages particular behaviours and mental processes,

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but, determines, to a large degree, how members of society think and feel (Bernstein et al., 1994). As Izard (1971) has pointed out, cultural differences in attitudes toward certain emotions are incorporated during socialization. For instance, as children grow, they learn an emotional culture, that is rules which govern what emotions are appropriate, in what circumstances and what emotional expressions are allowed (Bernstein et al., 1994). This can result in different relationships among the emotions and between the antecedents, concomitants, and consequences of a given emotion. These provide rules which vary from culture to culture and also within one culture over time. For example, in the United States, the emotional culture shifted from relative unconcern with anger in the last century to stricter suppression of the expression of anger in this century (Stearns & Stearns, 1986).

Furthermore, cultural-historic-political orientations generate certain cognitive styles (e.g. internal or external locus of control<sup>10</sup> or certain interaction dynamics (e.g. social support) (Harari, Jones & Sek, 1988) and influence cognitive appraisal. As Lazarus and Folkman (1984) contend, cognitive appraisal<sup>11</sup> processes are largely responsible for the varying response patterns among individuals under similar circumstances. For example, the environmental demands and pressures may produce stress in many people, but the degree and type of reaction

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<sup>10</sup> *Internal* locus of control refers to the belief that events or outcomes are due to one's own efforts or abilities. *External* locus of control refers to the belief that events or outcomes are primarily due to luck, chance, or similar factors beyond the control of the individual (Harari, Jones & Sek, 1988).

<sup>11</sup> Cognitive appraisal is the process of categorizing an encounter or event as its effect on well-being (Lazarus & Folkman, 1984).

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differs from individual to individual. Some may respond with anger, some with anxiety, and some may not be threatened at all (Harari, Jones & Sek, 1988). Research findings indicate that people in different cultures also differ in their judgements (Matsumoto, 1989; Pepitone & Triandis, 1987), particularly when rating intensity. For example, Ekman et al. (1987) reported that, when observers of different cultures rated the intensity of each of the universal expressions, the observers disagreed on the absolute intensity levels attributed to the expressions. The aforementioned therefore make it clear that the way members of Greek culture perceive, judge, and respond to a given situations may differ from the way individuals from other cultures perceive, judge and behaviourally respond to similar circumstances.

The importance of culture has been acknowledged by psychologists as well as anthropologists who have isolated many ways in which cultures differ (Berry et al., 1992). One interesting way of analyzing these differences is by describing cultures as either individualistic or collectivist (Bernstein et al., 1994).

The concept of individualism-collectivism has been described by Triandis (1985) as perhaps the most important dimension of cultural differences in social behaviour across the diverse cultures of the world (Hofstede, 1980). Individualistic cultures tend to accept people who place personal goals ahead of the goals of the collective (such as the family or work group), whereas collectivist cultures tend to reject such people and to encourage subordination of personal goals to the goals of collectives (Georgas, 1989).

Greece has been described as a collectivist culture (Vasiliou & Vasiliou, 1973; Katakis, 1984). The Greek culture differs from the

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Anglo-Celtic one in terms of its position on the individualism-collectivism dimension. A number of studies across cultures have identified English-speaking countries high on individualism (Hofstede, 1980; Hui & Triandis, 1986; Rosenthal & Bornholt, 1988). The studies of Vassilious were conducted in the mid-1960s.

A more recent ranking of different cultures related to collectivist-individualist values by Hofstede (1980) results in Greece being in a middle position. Findings of Triandis et al's. (1986) study of collectivist-individualist values are in line with those of Hofstede (1980). In a study conducted by Georgas (1989) it was found that the transition of the Greek society characterized by collectivist values, to a service-oriented and industrialized society, characterized by nuclear families and a narrow in-group, is accompanied by the rejection of the collectivist values and the gradual adoption of individualist values. This would also explain why the recent studies by Hofstede (1980) place Greece in the middle on the individualist-collectivist dimension (Georgas, 1989).

### CULTURE AND AGGRESSION

The predisposing variables in aggression are many and diverse. Biological inheritance and social learning history are important ones (Geen, 1990). In addition, as Geen (1990) has pointed out, the origins of human aggression can also be found to a considerable extent in the social and cultural context<sup>12</sup>. In a study (Jaffe et al., 1981) physical

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<sup>12</sup> To illustrate the point, sociologists refer to the Arapesh and Utku cultures. For the Arapesh of New Guinea there are strong norms for cooperation and peaceful coexistence. and aggressive behaviour is extremely rare (Mead, 1963). For the Utku -an Eskimo culture- aggression in any form is interpreted as a sign of social incompetence. In fact, they use the same word to mean

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aggression, its escalation, and felt responsibility for it, were compared between Israel natives and European Russian, Caucasian, and Georgian new immigrants to Israel. Generally, Georgians were the most aggressive and European Russians were the least so. The ethnic differences were seen as reflecting the influence of sociocultural training in aggression (Georgians) versus that of a history of severe punishment for aggression (European Russians) (Jaffe et al., 1981).

The existing evidence lead us to assume therefore that cultural differences in aggression appear to stem in part from differing cultural values (Domino & Hannah, 1987). Aggressive behaviour is much more common in individualistic than in collectivist cultures (Bernstein et al., 1994). Differences between collectivistic and individualistic cultures have been demonstrated in several studies (e.g. Domino & Hannah, 1987) which are the result of myriad aspects, from differential child rearing to differing sociopolitical climates.

The effects of culture on aggression can also be seen in the fact that the incidence of aggression in a given culture changes over time as cultural values change (Baron & Richardson, 1992). For example, Greek culture was initially characterized as collectivist, has moved to the middle on the collectivist-individualist dimension.

### CULTURE AND TEMPERAMENT

Another important variable that influences aggression, is temperament<sup>13</sup> (Edmunds & Kendrick, 1980). There is a belief that based

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aggressive and childish (Oatley, 1993).

<sup>13</sup>Temperament has been defined as one's behavioural style, the "how" rather than the "why" of behaviour, and it has been suggested that individual temperament characteristics significantly influence the manner in which a



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on general stereotypes and not on systematic research study, the temperament of Mediterranean people in general and Greeks in particular differs from the temperament of people from other geographical regions (Edmunds & Kendrick, 1980). Buss (1961) argues that the temperamental variables influencing the development of aggressiveness (impulsiveness, intensity of reaction, activity level, and independence) appear to relate loosely to personality dimension of extraversion (Eysenck, 1964). Eysenck (1964) describes the typical extravert as one who craves excitement, takes risks, is impulsive, tends to be aggressive, loses his temper easily, and does not control his feelings well. Eysenck therefore regards aggression as one of the definite traits of extraversion (Edmunds & Kendrick, 1980).

There is a growing body of research that indicates the importance of the cultural context in determining the developmental sequelae of various temperamental characteristics. The same temperamental characteristic may take on different meanings in different cultural contexts and, hence, may be related to different developmental consequences in various cultures. Findings of Prior, Kyrios & Oberklaid (1986) study of ratings of temperament across four cultural groups (American, Australian, Chinese and Greek) supported the notion of an *intrinsic ethnic difference* revealing similarities in temperament patterns of American and Australian infants (adaptability, readiness approach to new situations, positive mood, high persistence, high threshold of response, and high distractibility). This was not the case for Chinese and Greek infants which were both at the lower end of most

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person interacts with the environment over the long term and, hence, his/her psychological adjustment (Prior, Kyrios, & Oberklaid, 1986).

of these dimensions.

### CULTURE AND GENDER

Rohner (1976) included a cross cultural survey of a world sample of 101 societies and a review of 130 studies in the United States on psychological sex differences. His extensive survey suggested that there are substantial worldwide sex-linked variations, but, that one's culture is more predictive of one's aggression than is one's sex.

The findings of the study conducted by Domino and Hannah (1987) supported Rohner's (1976) (1983) suggestion. Domino and Hannah analyzed a set of 701 stories generated by Chinese and American children and significant sex differences emerged in the American sample only. The lack of statistically significant differences between Chinese boys and girls is due to the fact that Chinese children are treated equally in school, and sex differences are minimized. The significant sex differences in the American children are congruent with the literature that indicates greater aggression in boys and a greater strength of moral code in girls (Domino & Hannah, 1987; Maccoby & Jacklin, 1974).

Eron (1980) reported that a host of factors influences children's aggression (see p. 74). He suggested that girls are conditioned to express aggression in only a few acceptable ways, one being fantasy, and that there are fewer aggressive sex role models on television for girls than for boys.

Taken together, these studies indicate that, whether or not there is a biological predisposition for boys to be more aggressive than girls, these differences can be reduced to a minimum or increased to a maximum through socialization (White, 1983).

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### CULTURE AND SPORT-AGGRESSION

Aggression remains a phenomenon connected with certain features of society such as its structure, ideology and organization. Consequently, sport does not represent a zone free from the conditions of society but is embedded in the socio-cultural life and the dominant social values. In other words, sport can be as good or as bad as the society of which it is part (Pilz, 1979).

Rightly, Biddle (1995) argued that, despite the similarities in exercise and sport psychology in various parts of the world, when we study human behaviour, we cannot rely on research findings from one geographical area to explain all of human behaviour because it is influenced by the society and culture.

This is essential because cross-cultural analyses in sport have shown that the meaning of an activity may vary across cultural and racial groups (Thill & Brunel, 1995). In her cross-cultural analysis of achievement goals, Duda (1985, 1986) confirms that people's goal perspective varies as a function of race and culture. In another study (Madsen & Shapira, 1970) Anglo-American children showed higher degrees of competition than Mexican children. Some studies demonstrate that the way parents reward or punish success and failure affects the development of competitive or cooperative orientations. For instance, American mothers typically were found to reward their children after success, whereas Mexican mothers typically rewarded their children after both success and failure (Weinberg & Gould, 1995).

Essentially, the expectations that parents have of the development of various competencies of their children reflect cultural values (Rosenthal & Bornholt, 1988). Research findings indicate that

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cultures differ in fostering competitive or cooperative attitudes. It is not enough to say that we are competitive by nature; rather the kinds of *reinforcements* individuals receive and the social environment appear to be critical determinants of attitudes (Sherif & Sherif, 1969).

Culture moulds competitive behaviours not only in children but in adults as well. Sutton-Smith and Roberts (1964) have suggested that certain cultural predispositions are likely to stimulate predictable kinds of competitive and cooperative behaviour in children's games and in adult sport. However, it is unclear how much the "total cultural pattern" in which the athlete resides influences competitive sport behaviours, in contrast to the more immediate influences in performance situations. Pressures and presence of significant others have great influence on how hard and for what an athlete competes.

Orlick (1973) argued for a departure from the competitive philosophy and sports climate held within each culture. It can be usually seen as athletes compete for some of the world's larger powers in international competitions. It is likely that in the international competitive scene a compromise takes place between cultural values and -international- competitive demands. It may also depend on the emphasis each culture attaches on particular sports by tradition or because some sports reflect the economic interest of the particular culture on these sports (Cratty, 1981).

As Donnelly (1993) has noted values in western society involve materialism, achievement, dehumanization of athletes, winning is all that counts and a win-at-all-costs attitude, being aggressive, and deviation from the rules when necessary. These values originated in the

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USA. This contention was supported by several content-analysis studies conducted in the United States. Snyder (1972) has stressed that locker-room slogans used by coaches would also be a good indicator of American values in sport. The slogans identified related to physical and mental fitness, the idea that pain is a desirable and inevitable part of sport, aggressiveness and competitive spirit, and the like. Similar categories were evident in an analysis of American university athletic department press guides (Donnelly, 1993).

Americanisation<sup>14</sup>, is evident in Europe and takes a number of forms, entering in the lives of Europeans through language, etc. In terms of cultural, leisure pursuits, and sports, Americanisms have a powerful impact on European thought and lifestyles. American sports and especially the American style of sport are spreading rapidly (Donnelly, 1993).

The Americanisation of international sport is clearly replacing the Europeanisation of sport that occurred in the later part of the 19th century. The earlier European values of sportsmanship, strict amateurism, and the valuing of participation over success -a means rather than an end- are disappearing, even in Europe. *Win-at-all-costs* attitudes are shifting *sportsmanship* into a residual category, and fairplay is suffering a similar fate in European countries. North American players have been welcome in the European leagues. Together with the American-lifestyle, the American style in sport has also been adopted and is spreading to the traditional European sports (Donnelly, 1993).

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<sup>14</sup>Americanisation is defined as a process that involves the cultural, economic, and political diffusion or domination of American ideas, values, and social forms (Donnelly, 1993).

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All the above are the more interesting because Greek athletes have been in part influenced by the American way of life and style of sport, especially in the last decade when American athletes have been welcome in Greek leagues. Sport has a powerful impact on people's lives. Although there is no previous research to allow such a speculation, it seems likely that this may be one of the reasons that Greek culture was found to be mid-way on the collectivist-individualistic dimension. However, there are many differences across and between cultures which do not allow generalisations at least as far as athletes' aggressive behaviour is concerned.

In summary, the aforementioned has stressed the need for "cultural" research in exercise and sport psychology (Biddle, 1995) in general and in aggression in particular. Research in sport psychology is based primarily on investigations using Americans or subjects other than Greeks. Hence, the validity of these findings derived from these investigations may rest, to some extent, on beliefs that are culturally bound. Certainly a sample of athletes from one country may not be readily generalisable to other athletes elsewhere (Chandler, Shama, Wolf & Planchard, 1981). Consequently, as Biddle (1995) rightly noted, we cannot rely on research findings from one geographical area to explain all of human behaviour.

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### ANXIETY

Some years after the explosion of the first atomic bomb on Hiroshima the insightful observer, poet W.H. Auden stated that our era is the era of anxiety (Izard, 1991). Spielberger (1972a), who seems to share Auden's view has pointed out that "in the twentieth century, anxiety has emerged as a central problem and a predominant theme of modern life" (p. 5).

The construct of anxiety has generated some attempts at comprehensive theories and a great amount of research (Endler, 1975). An incredibly large volume of articles and books have been indexed in Psychological abstracts under the heading "anxiety", and numerous studies on anxiety and relevant topics have appeared in various journals. However, the fact that scientists who research on this area represent different theoretical orientations which reflect important differences in research goals and methodological formulations is a basic shortcoming in theory and research on anxiety (Spielberger, 1966).

As early as 1957 and 1962 Duffy noted that anxiety may be viewed as an uneasy feeling, transitory in nature, derived from some meaningful stressor and capable of influencing behaviour (Krotee, 1980). In contemporary psychology the term "anxiety" commonly denotes a palpable but transitory emotional state or condition that is characterized by feelings of tension and apprehension accompanied by autonomic nervous system activity (Landers & Boutcher, 1986). However, due to the diverse theoretical interpretations, a common definition of anxiety has never evolved. This has led to conceptual confusion and has been acknowledged as one of the major research problems. This

## Chapter 2: Review of the Literature

especially is the case in the field of sport psychology where anxiety appears to be also one of the most often studied personality factors in terms of its negative emotional effects or its energizing properties. As Cooke and Alderson (1986) have characteristically commented, "the situation appears to one where everyone acknowledges the problem and is unable to solve it" (p. 14). The problem of terminology is epitomized by Tutko and Richards (1971) who stated that anxiety is not a unitary concept (Izard, 1991), but includes both psychological and physiological components. Furthermore, the term anxiety has often been used synonymously or interchangeably with terms such as stress, threat, fear, and arousal (Silva III & Weinberg, 1984). Arousal in particular seemed to offer "a quantifiable equivalent to states of high emotion, especially fear and anxiety" (Neiss, 1988; p. 358), thus some researchers measure one emotion and then, in discussion, use the other concept as though it has been measured (Klavora, 1979). However, there is no conceptual ground for such a treatment even when two emotions are highly correlated. On the other hand, there is evidence that various measures of fear and anxiety showed only low-level correlation with indices of global arousal (Mewborn & Rogers, 1979), and also that physiological arousal and psychological fear are quite distinct (Fenz & Epstein, 1967). Thus, before proceeding with a discussion on anxiety a distinction should be made between the relevant concepts such as stress, threat, fear, and arousal.

### DEFINITIONS AND THEORIES OF ANXIETY

Stress has at times been defined as a stimulus variable, an intervening variable, and/or a response variable. Stress has also been



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described as both an environmental variable and an emotional response to a specific situation (Gould & Petlichkoff, 1988). Smith and Smoll (1982) suggested that these are two distinct entities and noted that it is important to distinguish between an athlete's perception of stress and potential environmental stressors (Gould & Krane, 1992). In order to address the inconsistencies in the use of the term stress, a process definition has been adapted by many sport psychologists (e.g. Martens, 1977; Passer, 1982) which is based on McGrath's (1970) conceptualization of stress as a social psychological process.

In McGrath's (1970) model, stress was defined as "a substantial imbalance between (environmental) demand and response capability, under conditions where failure to meet the demand has important consequences" (p. 20), "and is responded to with increased levels of A-state" (Martens, 1977, p. 9). This statement delineated between stress as an environmental influence mediated by one's perception and anxiety as the cognitive manifestation of stress. Specifically, according to McGrath, in studying the stress process, the following four interrelated stages that can readily be applied to the athletic environment must be considered (Figure 2.2): The first stage consists of an environmental situation or demand placed upon an athlete that may be perceived differently by different athletes. The second stage is the individual's perception of the environmental demand. The third stage in the model is the response of the individual that consists of increased physiological arousal as well as increases in A-state, *telic*<sup>1</sup> and *paratelic* states

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<sup>1</sup>In a *telic* state, the subject is goal-directed and serious and high arousal is perceived as negative affect. In a *paratelic*, high arousal state the subject is in an activity-oriented, positive affect state that is very enjoyable (Apter, 1989; Gould & Krane, 1992).

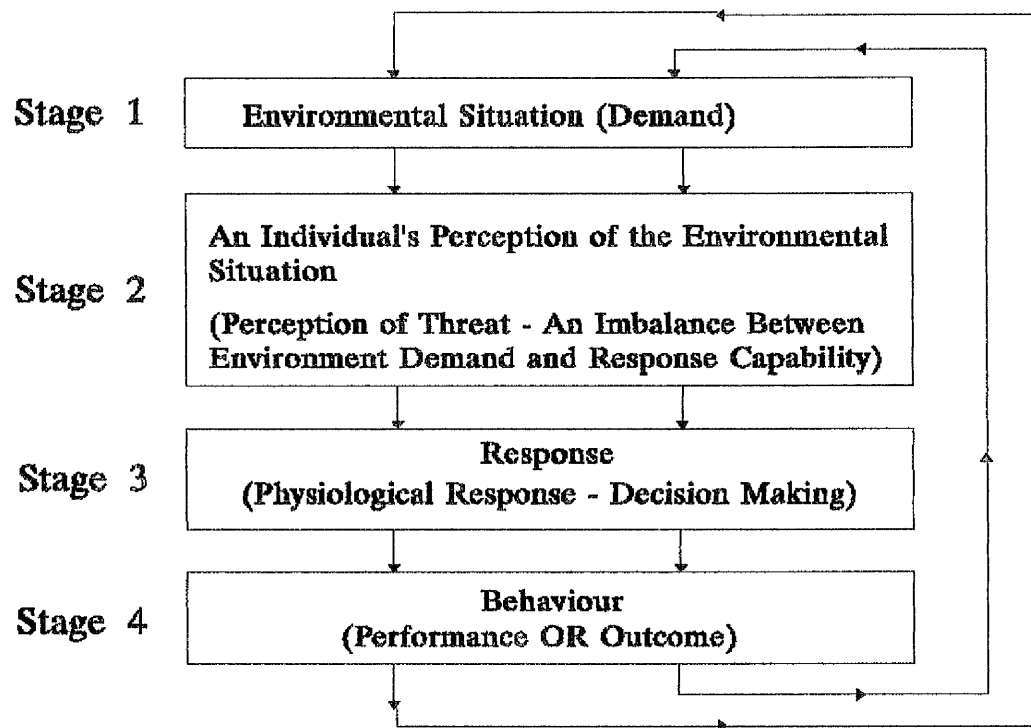


Figure. 2.2 : The Stress Process (Adapted from McGrath, 1970).

(Gould & Krane, 1992). The last stage in McGrath's model is the performance or outcome of behaviour.

Therefore stress occurs because the athlete feels that his/her self-esteem is threatened. Threat to self-esteem triggers the stress reactions which can be manifested at various physiological, behavioural, and social levels (Burwitz et al., 1982; Martens et al., 1990; Novaco, 1978; Scanlan, 1984). Thus, while stress refers to the objective stimulus properties of a situation, "*threat* refers to an individual's idiosyncratic perception of a particular situation as physically or psychologically dangerous" (Spielberger, 1972a, p. 30). The athlete's perception, on the other hand, of the significance of the

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*stressor*<sup>2</sup>, that is, the stimulus conditions that arouse stress (Spielberger, 1972a), is based on his/her appraisal of the competitive situation.

There are instances however of the simultaneous occurrence of good mood and stress, such as, sport parachuting (Singer, 1980). This is the pleasant or less extreme form of stress or otherwise *eustress*. The responses to both "kinds" of stress are manifested in the same way physiologically but the difference between them is that eustress does not lead to disfunction (Harris, 1980; Harris & Harris, 1984).

The physiology of anxiety is closely linked to the concept of *arousal*. As an overall effect of early and more recent research work, arousal has been seen in behavioural terms as the *intensity* dimension of behaviour, the state of the organism varying on a continuum from deep sleep (very low) to frantic excitement (very high) (Sonstroem, 1984). *Anxiety* on the other hand is the observable manifestation of arousal and is restricted to higher arousal states that produce feelings of discomfort or excessive concern (Cooke & Alderson, 1986; Sonstroem, 1984). Recently however, the concept of multidimensional arousal, a concept primarily suggested by Lacey (1967) has caused many arguments. Conclusive work on this issue however is very little, thus, it remains open and awaiting further research. Since arousal is one of the key concepts of this study it will be discussed more extensively

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<sup>2</sup>Stressors, according to Novaco (1978), are aversive events that disturb the organism's equilibrium, interfere with its performance or threaten its survival. Stressors have been classified into three broad categories based on the nature of the stimulus: 1) Somatic, e.g. physical exercise, heat, cold, 2) Cognitive, that can take the form of reduction in the time available to complete a task, an increase in task complexity etc., 3) Emotional, a stimulus which provokes anger, fear, etc. (Burwitz et al., 1982). However, stressors (e.g. various forms of provocation) often arise as a result of an individual's prior activity.

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later in this chapter.

In order to consider anxiety in relation to sport, it must be understood how anxiety as a part of athlete's personality affects his/her behaviour. Personality theorizing and research have been influenced by the following models: trait psychology, psychodynamics, situationism and interactionism (Endler, 1978). Hence, the concept of anxiety must first be looked at in terms of psychological models.

The Trait Model has assumed that the actual behaviour is primarily determined by traits<sup>3</sup> which are the basic and relatively stable units in personality. The trait approach assumes that traits are not linked to specific stimuli or responses, minimizing in this way the role of environmental factors.

Psychodynamic Theories focus on personality structure (id, ego, and superego) dynamics and development and in particular, on the continuous interaction of and conflict among them. The result of this conflict is anxiety and the development of defense mechanisms for the defence of the person's self-concept against this anxiety (Endler, 1978).

Situationism, that is an extreme reaction to trait psychology, has emphasized the situational factors as the primary source of

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<sup>3</sup>With regard to the acquisition of these behavioural predispositions Spielberger (1972, Vol. 1) suggested that during early childhood, individuals become conditioned to respond to a variety of stimuli with patterns of responses or behavioural predispositions which have survival value for the individual or group. The more frequently used response patterns become readily available behavioural predispositions or personality traits. The conditioning that results in the formation of these patterns is probably a very subtle nonconscious type of conditioning similar to that which Miller (1969) and his colleagues have demonstrated for many visceral and glandular processes. These behavioural predispositions are related to changes in neuronal structures and functioning; different behavioural predispositions involve different neural circuits or systems which interact with each other.

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behaviour (Magnusson & Endler, 1977; Mischel, 1968).

The trait approach and the situational paradigm were the issues rose endless arguments in the late 1960s and early 1970s between personality psychologists. Given the limitations of both the trait and situational paradigms, another alternative, an Interactional Approach has developed from these arguments. This approach views behaviour as the product of the reciprocal interaction of personal traits and the characteristics of different situations. The interaction is expressed by the equation (Lewin, 1935; in Martens et al., 1990):  $B = f(P, E)$ , where:  $B$  = Behaviour;  $P$  = Person;  $E$  = Environment.

Thus, according to interactionists, traits or dispositions may be conceptualized as tendencies, or predispositions, to perceive or respond to certain classes of situations with certain behaviour and predictable regularity. Personality traits may or may not manifested directly in behaviour, but can reflect individual differences in the frequency and intensity with which certain emotional states have been manifested in the past, and differences in the probability that behaviour associated with the traits will be manifested in the future in a variety of situations (Spielberger, 1972a, 1989).

Furthermore, recent work on interactional theory emphasises the role of cognition, that is perceived as an inextricable part of individual's perception. Thus, this model might also be named "bio-cognition", a term that differentiates it from the situationalist concept of cognition as a mediating factor between situation and behaviour (Cooke & Alderson, 1986).

The interactional model was empirically tested and its functional value has been supported (Flood & Endler, 1980). Since the

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interactional model incorporates the other approaches, it could be argued that this fact make it logically superior to them.

The psychological theories which are relevant in particular to competitive anxiety will be now reviewed, and a brief description of these theories will be presented.

### COMPETITIVE ANXIETY

There is evidence that in any competitive situation anxiety is a common occurrence. Individuals however differ in the way they approach and react to competition and this fact illustrates the differences in personality within sport. Specifically, individuals differ in competitiveness, that is the motive to approach success in sport situations, and in competitive anxiety, that is the counterpart of the motive to avoid failure in sport competition (Gill, 1986). Competitive anxiety and its effects on athletic performance are major concerns among both sport participants and sport psychologists. Because of this concern, voluminous research has been generated on the personality construct of competitive anxiety. However, most of the research conducted before the mid-1970s used the trait approach and global personality inventories, such as the Cattell 16-PF, etc. (Martens et al., 1990; Ostrow, 1990). Martens questioned the theoretical relevancy of these inventories to the sport settings and developed his approach of competitive anxiety by building upon the existing knowledge of anxiety. The main principals Martens based his approach are as follows:

- **The Interaction Approach** : The interactional theory predicts behaviour better than do trait or situational paradigms. Specifically, in sport context, to understand competitive anxiety one must consider

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the interaction of personality, that is the way one perceives the challenge of competition, along with the situational factors in competitive sport. Thus, while some athletes become tense when faced with intense competition, some others remain relatively calm. On the other hand, situational factors such as the presence of significant others, etc. might be the source for intense anxiety or excitement.

- Trait-State Anxiety Distinction : This distinction was based on Spielberger's (1966) concepts of state anxiety and trait anxiety. A brief summary of the assumptions of Spielberger's (1966, 1972a) anxiety theory is presented in Appendix 1 (Figure A.1.1). *State-Anxiety (A-State)* is defined as a transitory emotional state characterized by feelings of tension and apprehension accompanied by increased physiological arousal. Specifically, A-state is referred to the complex emotional reactions that are evoked when individuals interpret (specific) situations as personally dangerous. When a person perceives a situation as threatening, irrespective of the real danger, then it is assumed that he/she will respond with an elevation in A-state. By contrast, *Trait-Anxiety (A-Trait)* refers to relatively stable individual differences in anxiety proneness, manifested in the frequency with which an individual experiences elevations in A-state in response to stresses in one's environment. Persons who show high A-trait are more strongly disposed to view any given situation as threatening and dangerous, and tend to experience anxiety reactions with greater frequency and intensity over time than persons who are low in A-trait (Hodges & Spielberger, 1969; Spielberger, 1966, 1972). *Competitive Trait Anxiety* represents, therefore, a relatively stable intrapersonal mediator of state anxiety responses to specific

competitive situations.

- **General versus Specific Anxiety :** Although highly trait anxious individuals tend to become anxious in stressful situations, they do not become equally anxious in all types of situations. Thus, in studying anxiety, researchers adopted the situation-specific approach (Mandler & Sarason, 1952; Mellstrom, Cicala & Zuckerman, 1976). Martens (1977) proposed the competitive trait anxiety construct as a personality variable, which is the sport-specific modification of the more general A-trait construct and is defined as "a tendency to perceive competitive situations as threatening and to respond to these situations with feelings of apprehension and tension" (p. 23).

- **Competitive Process :** The final step of Martens' approach, is that competition is viewed as a process and competitive anxiety within the context of the competition process. Martens (1975c) presented a model of the competitive process where competitive A-trait was specified and linked to four elements. This model applies a cognitive (stimulus - cognition - response) paradigm. As Martens (1977), and Martens et al. (1990) have pointed out, the important feature of the competitive process model is the emphasis on the organism as a mediator between stimulus and response. Furthermore, Martens et al. described the components of this model, which are as follows:

- **The Objective Competitive Situation (OCS).** The OCS defines the situational-environmental factors (type of task, the playing conditions and rules, extrinsic rewards, etc.) that affect competitive anxiety. Since the OCS defines the situational demands for the person it is likely to contain certain sources of threat. The primary source of anxiety in a competitive situation is the *threat of evaluation*.



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Researchers have also suggested that *fear of failure* and *fear of physical harm* are prevalent sources of A-state. Competitive A-trait directly affects the perception of threat, which mediates A-state responses to the OCS (Martens et al., 1990).

- **The Subjective Competitive Situation (SCS).** An individual's perception of the OCS is termed SCS and describes a process that occurs within the individual athlete. Thus, the SCS is mediated by such factors as personality, abilities and other intrapersonal factors.
- **Response.** Individual responses to OCS can be behavioural (e.g. performing well), physiological (e.g. rapid heart rate) and psychological (e.g. increased A-state).
- **Consequences.** Consequences are viewed in terms of success and failure as positive or negative respectively. These are thought to determine to some extent individual differences in competitive A-trait.

### MULTIDIMENSIONALITY OF A-TRAIT AND A-STATE

More than one decade ago, Endler (1978) asserted that, both A-trait and A-state, were multidimensional. He further proposed an interactional A-trait model of anxiety which assumed that it consisted of five components, which may interact with the situation of the individual. These five dimensions are: physical danger; ambiguity; innocuousness; interpersonal ego-threat; social evaluation threat.

According to Endler, A-state occurs when there is congruency in the interaction between the type of situation (e.g. competition) and an individual's tendency in terms of trait components. Martens (1977, 1978a) commented that Endler is "parsimonious" in suggesting five components and that A-trait might consist of two components: fear of

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physical harm and fear of psychological harm. However, he could not support his contention empirically.

With regard to state anxiety, Endler (1978) proposed a two-component model of A-state, which he labelled cognitive-worry and emotional-arousal. However, this line of research has been generated from the work of Liebert and Morris (1967), Borkovec (1976), and Davidson and Schwartz (1976) who distinguished between cognitive and somatic components of anxiety. According to them, worry refers to cognitive elements of anxiety, such as negative expectations and cognitive concern about performance, consequences of failure, negative self-evaluation, evaluation of one's ability relative to others, inability to concentrate and disrupted attention (Davidson & Schwartz, 1976; Liebert & Morris, 1967). Emotionality on the other hand refers to one's perception of the affective-physiological elements of anxiety, generated from increased autonomic arousal and unpleasant feeling states such as nervousness, tension and upset (Deffenbacher, 1978, 1980; Morris, Davis & Hutchings, 1981). These theorists also proposed that the cognitive and somatic components of anxiety differentially relate to other variables. For example, in a study of test anxiety, worry and lack of confidence were more highly related to performance than emotionality or autonomic arousal (Doctor & Altman, 1969). Another study of test anxiety showed emotionality to decrease from pre-examination period to post-examination period while worry remained stable (Smith & Morris, 1976). However, as these theorists noted, the distinction between worry and emotionality is a tentative one because the two are intercorrelated. The intercorrelation between them ranged from .55 to .76 in situation which involved evaluative stress. They

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further argued that this degree of intercorrelations does not invalidate the distinction between the two factors. Deffenbacher (1980) summarised a number of studies conducted with high school and college athletes taking classroom exams. The pattern that consistently emerged from these studies was that: a) worry and emotionality were significantly correlated; b) worry consistently formed a negative or inverse relationship with performance expectations and actual test performance; c) findings for emotionality were more inconsistent since it was found that emotionality was either unrelated or negatively related to performance measures; d) worry was the more important variable of the two, accounting for more variance in relationships with performance and performance expectations.

More recent research identified two similar components of anxiety that labelled cognitive anxiety and somatic anxiety and which are essentially the same as the ones identified by Liebert and Morris. Researchers appreciated the multidimensionality of anxiety and this brought about further research into this area and led to the construction of inventories (e.g. Cognitive-Somatic Anxiety Questionnaire (CSAQ) by Schwartz, Davidson and Goleman (1978)) aimed to measure cognitive and somatic anxiety. Results of the studies conducted suggest that the components of anxiety co-vary because many stressful situations contain elements related to the onset of each component (Jones & Hardy, 1988).

In the context of sports, recent anxiety literature has focused on the multidimensional nature of competitive anxiety (Burton, 1988; Jones, Swain & Cale, 1990; Martens et al., 1990). The Multidimensional Theory of Competitive State Anxiety was developed by Martens and his

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associates (Burton, 1988; Martens et al., 1990), who employed a theoretical basis founded in the work of Borkovec (1976), Davidson and Schwartz (1976), and Morris, Davis and Hutchings (1981). According to this theory, the *cognitive* component of state anxiety is closely associated with negative expectations about performance, fear about the consequences of failure and negative self-evaluation, inability to concentrate, and disrupted attention. On the other hand, *somatic A-state* reflects the physiological responses that develop from the autonomic nervous system such as rapid heart rate, tense muscles, shortness of breath, butterflies in the stomach, and sweaty palms. Martens et al. (1990) hypothesized that cognitive and somatic anxiety have different antecedents. The antecedents of cognitive anxiety, and also those of self-confidence, are those factors in the environment which are related to the athlete's expectations of success such as perception of one's own ability, based largely on previous competitive experience, perception of opponent's ability and feedback (Caruso, Dziewaltowski, Gill & McElroy, 1990). An individual's expectations about performance as well as situations perceived to be more threatening (i.e. lower chance of success) will also influence cognitive anxiety (Bandura, 1989; Krane et al., 1994; Krane, Williams & Feltz, 1992).

Consequently, when expectations decrease or become uncertain, the athlete is likely to experience an increase in cognitive anxiety and a lowering of self-confidence. Alternatively, cues that elicit somatic anxiety are thought to be non-evaluative, of shorter duration, and consisting mainly of conditioned responses to stimuli (Morris, et al., 1981). In the sporting context these would include changing-room preparation, precontest warm-up routines, game importance, and crowds

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(Gould et al., 1984; Martens et al., 1990).

Jones, Swain and Cale (1990) examined situational antecedents of cognitive anxiety, somatic anxiety and self-confidence in a sample of elite male intercollegiate middle-distance runners 1 hour prior to performance via the Competitive State Anxiety Inventory-2 (CSAI-2) (it will be described in more detail later in this section). Stepwise regression analysis demonstrated that cognitive anxiety was predicted by the perceived readiness, attitude toward previous performance, and position goal factors. However, none of the factors were found to significantly predict somatic anxiety. Self-confidence was also predicted by two factors, perceived readiness, and external environment. These findings suggest that cognitive anxiety and self-confidence share some common antecedents but that there are also factors unique to each of them (Jones, Swain & Cale, 1990).

Another advance in theory has been made with the realization that absolute levels of anxiety are not as important factor as patterns of change are. That is, somatic anxiety tends to peak rapidly and should dissipate once the performance commences, while cognitive anxiety increased much earlier than somatic anxiety and should remain unchanged until evaluative feedback on the success or failure of performance is received (Swain & Jones, 1992). Moreover, Martens et al. (1990) argue that the components of anxiety are conceptually independent and that they influence behaviour differently. Thus, while one person may respond to a stressor primarily with cognitive A-state, another may experience somatic A-state; or the same person in different situations may experience primarily cognitive or somatic A-state. Then, can be independently manipulated.

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Despite their theoretical independence, research has established that the CSAI-2 components are moderately correlated in precompetitive situations. In the original CSAI-2 validation studies, Martens and colleagues found mean correlations of .55 for cognitive and somatic A-state, -.61 for cognitive A-state and self-confidence, and -.57 for somatic A-state and self-confidence in pre-competitive situations.

To illustrate that the components are independent and triggered by different antecedents, Martens et al. (1990) have examined the pattern of change for the components based on the proximity of competition. The CSAI-2 was administered to high school wrestlers during the following times before competition: 1) 48 to 64 hours, 2) 20 to 24 hours, 3) 2 hours, 4) 1 hour, and 5) 15 to 20 minutes. The results revealed that for somatic anxiety, the only significant difference was between times 4 and 5, indicating a significant elevation of A-somatic at the time wrestlers were waiting for the preceding match. With regard to cognitive anxiety, it was higher than was somatic 2 to 3 days before competition. The changes observed in cognitive anxiety over this period were not significant and thus, it was interpreted by these researchers to be essentially the same over the five times they were measured. State self-confidence followed a similar unchanging pattern and only a slight decrease at time five was observed. Martens et al. replicated the study with a sample which comprised of elite gymnasts. The results of the gymnasts were similar to those of the wrestlers, providing additional support to their hypotheses.

Some other studies, however, produced results which appeared to contradict the findings reported above with regard to somatic anxiety.

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Pates and Parfitt (1992) investigated the temporal patterning of cognitive and somatic anxiety. Their subjects were basketball players, who completed the CSAI-2 immediately before, during and after two competitions. Their findings did support Martens prediction about cognitive anxiety but not the temporal patterning of somatic anxiety since it did not change until after the competition. Similar results reported by Jones and Hardy (1988) and Hardy and Parfitt (1991), who found no significant increase in somatic anxiety in the experimental anxiety condition or prior to competition. The same authors cited evidence which indicates that in a variety of settings the physiological response associated with anxiety continues to fluctuate during performance. But, as they further noted this evidence though suggestive, does not prove that somatic anxiety fluctuate during performance. This inconsistency might be attributed to different time scales which existed in these studies. For instance, in the studies which demonstrated elevation of somatic anxiety a short time before competition /event both cognitive and somatic anxiety was measured over a period of days leading up to an event. In contrast, the time scale of the studies found no increase in somatic anxiety was reduced to minutes as opposed to days. The difference in time of completion of the questionnaires (just before competition as opposed to approximately before competition), and the small sample size employed in these latest studies are alternative explanations.

In another study, Vealey (1990) conducted a meta-analysis in order to examine collectively the intercorrelations between the CSAI-2 components of five studies. These analyses indicate moderately high interrelationships between the CSAI-2 components in precompetitive

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situations. As Morris et al. (1981) suggest, it is likely that the threatening precompetitive conditions aroused all three state manifestations. Or as Borkovec (1976) argues, the arousal of one component in the precompetitive situation may serve as a stimulus for the conditioned response of the other component.

Martens et al. (1990) predictions were also confirmed by a number of studies of sport psychology researchers who have adopted the time-to-event paradigm in an attempt to establish the nature of the patterning of the anxiety dimensions (Barnes et al., 1986; Gould, Petlichkoff & Weinberg, 1984; Jones, Swain & Cale, 1991).

Krane and Williams (1987) compared changes in cognitive anxiety, somatic anxiety, and self-confidence 24 hours, one hour, and ten minutes prior to competition by high school gymnasts and collegiate golfers using a version of CSAI-2. Results showed that the golfers and gymnasts had different patterns of change in the CSAI-2 components. The gymnasts displayed an increase in cognitive and somatic anxiety and a decrease in self-confidence while the golfers showed a decrease in cognitive anxiety, an increase in self-confidence and no change in somatic anxiety. Overall, the golfers had lower cognitive and somatic anxiety and higher self-confidence than the gymnasts.

Different temporal patternings than the original studies were also found in the field study of Karteroliotis and Gill (1987). According to them somatic anxiety did not increase significantly from baseline to precompetition as expected. Instead, both cognitive and somatic dimensions followed similar patterns particularly during competition. However, these studies support the independence of the CSAI-2 components by demonstrating different patterns of change prior



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to and during competition (Vealey, 1990). These researchers concluded that future studies using CSAI-2 in a field setting should consider task characteristic, such as complexity and attentional demands as well as the environmental conditions of the competition including time constraints, and the degree of real or perceived threat.

Other research findings have shown, however, that the patterning of the multidimensional competitive state anxiety components may differ as a function of individual difference variables, including gender and type of sport (Jones & Cale, 1989a; Swain & Jones, 1992). Jones and Cale (1989) reported differential precompetition temporal patterning for cognitive anxiety, somatic anxiety and self-confidence in males and females. Findings for the males supported theoretical predictions for all three subscales of the CSAI-2. However, this proved not to be the case for the females, with temporal patterning for each of the multidimensional subcomponents failing to support the theory predictions. Support for the different patterning of cognitive anxiety and self-confidence was found by Jones et al. (1991), although their results did not support Jones and Cale's (1989) findings for somatic anxiety. What these studies demonstrate is that the various individual-difference variables may mediate the theoretical predictions concerning the precompetition temporal patterning of the CSAI-2 subscales (Swain & Jones, 1992).

Further support to all multidimensional anxiety theory predictions concerning performance was provided by Burton (1988). It was argued that the primary reason for the "success" of these findings

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was that the researcher utilized an intra-individual<sup>4</sup> approach in the assessment of the CSAI-2 responses.

In summary, results concerning the precompetition temporal patterning of the cognitive and somatic components of the CSAI-2 are fairly consistent, and indicate that cognitive anxiety remains relatively unchanged prior to competition. Somatic anxiety, on the other hand, tends to increase rapidly as time to compete nears (Gould et al., 1984). Studies have shown that the patterning of self-confidence is generally less consistent during the precompetition period (Jones, 1991; Parfitt, Jones & Hardy, 1990).

Martens multidimensional anxiety theory has been criticized basically for its limitations in explaining the interactive process between the two components of anxiety. Hardy and Fazey (cited by Hardy, 1990) argued that for a model of anxiety and performance to be satisfactory it must be at least three-dimensional and they proposed the catastrophe model of anxiety (Hardy, 1990; Hardy & Parfitt, 1991).

According to Hardy and Fazey anxiety has at least two components, cognitive anxiety and physiological arousal response which, as related to performance, should be investigated independently, but that the interaction between two anxiety subcomponents will influence performance. Catastrophe theory examines the combined influence of cognitive and somatic anxiety on athletic performance. One major premise of catastrophe theory considers cognitive anxiety to moderate the relationship between somatic anxiety and performance. That is,

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<sup>4</sup>Intra-individual approach: These analyses involve taking multiple measurements (e.g. state anxiety) in the same athlete and then relating the individual's (anxiety) deviations around his/her norms to performance as opposed to comparing absolute (state anxiety) scores between subjects and then linking these scores to performance (Jones, Swain & Hardy, 1993).

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somatic anxiety will differently relate to performance, depending upon the level of cognitive anxiety. When cognitive anxiety is high, high somatic anxiety will negatively impact performance. However, when cognitive anxiety is low, somatic anxiety may be facilitative to performance or have a curvilinear relationship with performance (Hardy, 1990).

Fazey and Hardy (cited by Hardy, 1990) further tested the catastrophe theory and they concluded that their findings contradicted previous research findings and supported the catastrophe theory as a whole. While Hardy and Fazey's model is a challenging one, research has only provided some support for the model's predictions (Hardy et al., 1994; Krane et al., 1994) (for instance, the relationship between somatic anxiety and performance is still uncertain). More recent findings (Edwards & Hardy, 1996) also suggest that the same and other predictions of the model should be further tested empirically for the validity of this model to be established (Hardy, 1996).

Because anxiety is generally considered as an important factor playing a major role in sport performance (Harger & Raglin, 1994), a number of theories and hypotheses have been proposed to account for the relationship between arousal and athletic performance or anxiety and athletic performance. Many of the earlier theories have examined the arousal construct, whereas more recent theories were developed based on the anxiety construct. Two relatively early theories that were proposed and tested in the sport and motor performance context were the drive theory and the inverted-U hypothesis. More recently, additional theories have been advanced. These include Hanin's optimal zones of arousal hypothesis, and reversal theory (Kleine, 1990). However, since

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examination of the anxiety and performance relationship is beyond the scope of the present study, no further discussion regarding this issue will be made. Nevertheless, the interested reader can find more information on this topic in the following references: Apter (1989), Horn (1992), Weinberg and Gould (1995).

### MEASUREMENT OF ANXIETY

One of the prevalent issues in anxiety research is that its measurement is actually done through the measurement of arousal. Three methods have been used for the measurement of arousal, which are:

- **Physiological measures:** are those which indicate an individual's heightened autonomic activity and responses such as heart rate, blood pressure, etc. However, in spite of expectations, results of several studies confirm that "no physiological measure is an unambiguous measure of anxiety" (Tyrer & Lader, 1976). The lack of consistent results and the low correlations found among the physiological measures has been explained by the principle of "autonomic response stereotypy" that is, each individual responds to anxiety by activating its favoured system(s) (Burwitz et al., 1982). Nevertheless, despite of these problems, with the introduction of more sophisticated and cheaper equipment, physiological measures have much potential as reliable indicators of the arousal response.

- **Biochemical measures:** According to Burwitz et al. (1982), this approach provides reliable and accurate measure of anxiety. In stressful situations the products of adrenal glands (epinephrine, norepinephrine as well as a variety of corticosteroids) enter in the bloodstream. To examine increases in hormonal levels analyses of either

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blood or urine are used. However, Landers and Boutcher (1986) argued that it is unclear how accurately these measures reflect the brain's overall hormonal levels. On the other hand, these analyses are complex, expensive, and time-consuming that make them not an optimum choice.

- **Psychological measures:** Anxiety has typically been measured with self-report questionnaires (Gould & Krane, 1992). Psychological inventories have become the more popular measure of anxiety because of the ease of administration, especially in field settings and the valid assessments of anxiety state (Hackfort & Schwenkmezger, 1989; Harger & Raglin, 1994). They can measure cognitive variables and/or physiological responses directly (Scanlan, 1984). As Tyrer and Lader (1976) and Mewborn and Rogers (1979) argued, self-report of anxiety may be more sensitive than physiological measures (heart rate and skin conductance) and thus, preferable to physiological measures (Harger & Raglin, 1994; Raglin, 1992). Self-report measures have been criticized, especially in regard to a) their insensitivity to changes in arousal levels, b) by being susceptible to such undesirable effects as the social desirability response<sup>5</sup> (Hackfort & Schwenkmezger, 1989; Neiss, 1988; Williams & Krane, 1989) and, c) because they usually "necessitate large samples to offset the inherent variability among subjects" (Landers & Boutcher, 1986; p. 169). Martens defended their use by stating that "the assessment of A-state through self-report measures tells us more about the subject's general state of arousal than any

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<sup>5</sup>As cautioned by Williams and Krane (1989) and Martens et al. (1990), researchers need to be aware of the potential for social desirability bias and take steps to minimize it. This can be accomplished by developing a good rapport with athletes, using anti-social desirability instructions with questionnaires, and using a social desirability scale to identify athletes likely to repress their true feelings (Gould & Krane, 1992).

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single or composite index of physiological measures" (1977; p. 115).

From the measures reviewed above, the psychological ones were favoured by the majority of researchers working in the field of sport psychology. More than two decades ago, however, it was common practice in this domain to use global personality inventories which relied on personality trait theory. As a result, sport personality research suffered from the use of incompatibility between the purpose of the investigation and the tests, which in turn were associated with conceptual, methodological and interpretative problems (Martens, 1977). Later, the State-Trait Anxiety Inventory (STAI) was developed by Spielberger et al. (1970) to measure both state and trait anxiety. This measure has been used widely in the field of sport psychology and though not sport-specific, it could be said that its utility was established in the sport research.

Martens was among the first who advocated abandoning the strict reliance on personality trait theory and its assessment instruments in favour of an interactionist perspective. He felt that sport specific psychological measures needed to consider how the characteristics of the individual athlete were mediated within the sport environment to elicit a behavioural response. To serve this purpose, Martens (1977) designed a sport specific instrument to assess individual differences in competitive trait anxiety. The Sport Competition Anxiety Test (SCAT), as it was labelled, consisted of fifteen items but since five items are spurious only ten of them are actually scored. Subjects are asked to indicate how they *generally* feel when they compete in sports and games, and respond to each item using a three-point ordinal scale (hardly ever, sometimes, often) (more information about the SCAT and

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its psychometric properties are given in the chapter 4). The SCAT used in a series of laboratory and field studies conducted by Martens (1977); Martens and Gill (1976) and several other researchers (Brustad, 1988; Brustad & Weiss, 1987; Gould, Horn & Spreeman, 1983; Lewthwaite, 1990; Martin, 1976; Passer, 1983; Rainey & Cunningham, 1988).

Recently, a multidimensional measure of trait anxiety has been developed by Smith, Smoll and Schutz (1990). The Sport Anxiety Scale (SAS) was developed as a sport-specific measure of somatic reactions, cognitive worry, and concentration disruption. Because of the newness of the SAS, findings concerning this instrument have not yet been replicated within the multidimensional theory of anxiety.

Within sport, state anxiety was usually measured using the STAI A-state scale. Martens et al. (1980) did develop an instrument for the assessment of state anxiety by modifying Spielberger et al.'s (1970) state anxiety scale. They identified 10 items which were more sensitive to changes in the competitive sport context. This new scale was named Competitive State Anxiety Inventory (CSAI)<sup>6</sup>.

However, in the past decade a trend toward more multidimensional instruments was apparent. The conceptual distinction between cognitive and somatic A-state on the other hand initiated the reconceptualization of competitive A-state. The development of the multidimensional theory

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<sup>6</sup> It should be noted that, recently, Kleine (1990) conducted a meta-analysis of fifty empirical studies published between 1970 and 1988 which met the minimal requirements for a quantitative synthesis of results. As he has noted, when comparing the population effect sizes resulting from the trait and the state version of the STAI with those for the SCAT and the CSAI-1, no substantial differences emerged favouring the one or the other inventory. This may be due to the fact that CSAI-1 was a modifying version of STAI state scale. Hence, to accept the saliency of general anxiety or of another psychological state measures for sport situations, results from studies using sport-specific instruments must be consistently replicated with general measures before any decision for their usage in sport context is made.

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of competitive state anxiety was obviously followed by the need for a sport-specific instrument to measure these constructs.

In congruence with contemporary anxiety research and theory Martens et al. (1990) did revise the CSAI to account for both components of A-state. Under iterative factor analytic procedures, the presumed cognitive A-state factor split into two separate components. A third factor in addition to the expected cognitive and somatic anxiety factors was revealed. This factor identified as self-confidence and comprised the positively worded items that were initially presumed to form part of the cognitive anxiety scale, and the negatively worded items labelled as cognitive anxiety. This led Martens et al. to hypothesize that cognitive anxiety and self-confidence represents opposite ends of the same cognitive evaluation continuum (i.e. a high level of cognitive anxiety being viewed as low self-confidence or alternatively, high self-confidence being acknowledged as a minimal amount of cognitive anxiety). Their assumption is in line with cognitive theories of anxiety (e.g., Bandura, 1977; Wine, 1980, 1982) in which anxiety and self-confidence are conceptualized as opposite poles on a worry continuum, that is, self-confidence is viewed as the absence of cognitive anxiety. Man et al. (1995), however, have pointed out that the existing findings are contradictory, especially in sport psychology. According to them some evidence in sport settings suggests that self-confidence and cognitive anxiety are orthogonal (Jones & Hardy, 1989; 1990). The Competitive State Anxiety Inventory-2 (CSAI-2) consisted of twenty seven items, measuring cognitive anxiety, somatic



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anxiety and the self-confidence<sup>7</sup> factor which is characterized by positive expectations of success. Subjects are asked to indicate how they feel *right now* when they compete in sports and games, and respond to each item using a four-point scale (Not at all, Somewhat, Moderately so, Very much so) (more details about CSAI-2 and its psychometric properties are given in the chapter 4).

The development of the Competitive State Anxiety Inventory-2 (CSAI-2) has been acknowledged as a significant advance in the measurement of competitive state anxiety within the area of sport psychology (Krane & Williams, 1987; Swain & Jones, 1992). As researchers have stressed the most reliable and valid sport specific state anxiety instrument is the CSAI-2 (White & Barclay, 1991). Although the CSAI-2 is a relatively new instrument, research into competitive state anxiety over the last decade has been dominated by studies which have been adopted it as the primary measuring instrument (e.g. Caruso et al., 1990; Karteroliotis & Gill, 1987) to examine various aspects of competitive anxiety, including temporal patterning (Krane & Williams, 1987) antecedents (Jones et al., 1990, 1991) and prediction of performance (Burton, 1988; Hardy & Parfitt, 1991).

Recently, however, researchers have identified certain limitations associated with the measurement of anxiety in this line of investigations (Burton, 1989; Parfit et al., 1990). More specifically, Jones (1991) stated: "it is important to recognize that the CSAI-2, like many other state anxiety measures, is based on a somewhat limited

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<sup>7</sup> Vealey (1986) building from various approaches to the study of self-confidence in psychology (e.g. Bandura, 1977) conceptualized sport-specific self-confidence as the degree of certainty athletes possess about their ability to be successful in sport. She further separated sport self-confidence into trait (dispositional) sport confidence and state sport confidence.

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dimension of the anxiety response" (p. 153). His view is in accord with this of Kroll (1982) who has noted that most anxiety scales seek to monitor the *intensity* of anxiety signs and symptoms present in the emotional response stage.

According to Jones (1991) the CSAI-2 essentially measures the intensity of symptoms which signify the presence of anxiety and not what might be referred to as the *directional perceptions* of the symptoms. In other words, whether the individual interprets those symptoms as negative or positive in relation to impending performance. He contended that the reason why the intensity - alone approach has prevailed is due to the fact that the concept of anxiety has largely been viewed as negative and detrimental to performance. However, Mahoney and Avenier's (1977) findings indicated that anxiety does not necessarily have negative connotations. These findings were supported by the results of studies conducted by Parfitt and Hardy (1987), Jones and Cale (1989b), and Jones and Swain (1995).

Jones et al. (1993) conducted a study in order to examine relationships between intensity and direction dimensions of competitive state anxiety. The sample divided into poor and good performance groups. All the subjects completed the CSAI-2 plus a direction scale in which subjects rated the degree to which they experienced intensity of each symptom as either facilitative or debilitating to subsequent performance. As Jones et al. noted, the good performance group reported their cognitive anxiety intensity as being more facilitating and less debilitating to performance than the poor performance group.

Sport psychologists (e.g. Parfitt et al., 1990) have suggested that to gain a greater understanding of competitive state anxiety

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researchers can benefit from examination of dimensions such as frequency. *Frequency* refers to how often the athlete is experiencing his/her anxiety symptoms. This need is particularly evident in the case of the time-to-event paradigms.

In an attempt to extend understanding of both intensity and frequency dimensions of the competitive state anxiety response during the pre-competition period, Jones (1991) and Parfitt et al. (1990) have introduced the notion of cognitive intrusions. The term *cognitive intrusions* refers to the extent to which an athlete's mind is occupied by thoughts about the forthcoming event. Jones and colleagues have argued that cognitive intrusions regarding the forthcoming event are likely to be less frequent 1 week before than at 30 min before a competitive event.

Swain and Jones (1990) investigated empirically this proposal, examining the pre-competition temporal patterning of cognitive anxiety, somatic anxiety, and self-confidence, paying attention to the intensity of anxiety symptoms, the frequency of cognitive intrusions as well as the frequency of actual anxiety symptoms. In one study, the CSAI-2 and a single additional "percentage thinking time" item were administered to athletes at five stages during the pre-competition period; in another study, a modified version of CSAI-2 scale (intensity) as well as a frequency scale for each of the 27 items of CSAI-2 on four occasions during the period leading up to an important competition were completed by the athletes. In addition, a number of in-depth interviews were conducted in order to examine in greater detail the nature of athletes' cognitions. The results of these studies led the researchers to conclude that their findings do provide evidence of the existence of

additional dimensions of anxiety that of direction and frequency. Also, additional support to the direction dimension of anxiety has been provided recently (Jones, Hanton & Swain, 1994). In assessing the value of the findings from these studies, it is worth emphasizing an important factor which is relevant to the interpretation of the findings. The direction and frequency scales which were added to the original CSAI-2 for the purpose of the investigations have not been validated. Future research should address such validity issues (Swain & Jones, 1993).

In the present study, to overcome the constraints posed by the usage of the psychological instruments, the anti-social desirability instructions along with a large sample size were employed. The decision as to which instruments from the existing ones were the most suitable for this study was based upon certain criteria which are presented in Appendix 5. Since both, the Sport Competition Anxiety Test (SCAT) and the Competitive State Anxiety Inventory- 2 (CSAI-2) seemed to fulfill the requirements, their use was decided for the present study.

### RELATIONSHIP BETWEEN COMPETITIVE A-TRAIT, COMPETITIVE A-STATE AND OTHER FACTORS

#### 2.2.1. SPORT CATEGORY

When considering anxiety in sport, the specific sport contest must be taken into account. In this study, the comparisons made were between contact and non-contact sport, and individual and team sport athletes. These two pairs of different types of sport were chosen for the following reasons: Contact sport athletes should confront their opponents in person and in fact the danger of physical and psychological harm is increased (Martens et al., 1990). In contrast,

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for non-contact sport athletes the element of threat arising from physical contact is absent.

On the other hand, in individual sports the focus is directed on personal performance. This means that the individual athlete is responsible for the outcome and thus the threat of evaluation is maximized. In contrast, and without overlooking the specific events when the performance of a team sport athlete is highlighted (e.g. a free throw in basketball), for team sports athlete the individual performance is less apparent. Since individual performance is only a part of the general action of group performance, errors and responsibilities are shared among teammates (Scanlan, 1984). The impact of highlighted individual performance on the autonomic arousal levels was demonstrated in an early study conducted by Hanson (1967). Subjects of this study were baseball players of the Little League. Results indicated that, when batting, players' heart rates escalated to an average of 166 beats per minute, that was 56 beats above their mean testing rate of 110. Although it is not clear whether increases in autonomic arousal reflected stress reactions for all players, the above field study provides evidence that autonomic arousal increases as personal performance becomes accentuated. Though this finding illustrates how stressful a specific event can be for a team player, it becomes apparent that this can be particularly true for individual sport athletes whose performance is throughout the competition the focal point for many other athletes.

Martens et al. (1990) reviewed the studies which have examined the relationship between competitive A-trait and type of sport and reported that no significant differences were found on this issue.

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However, there is some evidence that these task characteristics (contact vs non-contact, team vs individual) are related to competitive state anxiety, but research findings concerned with this relationship are limited. Martens et al. (1982) reported that higher anxiety states are elicited in contact sports compared to non-contact sports, and in individual compared to team sports. In accord with Hanson (1967), field studies conducted by Griffin (1972) and Simon and Martens (1979) indicated that athletes of individual sports exhibited greater pre-competitive A-state than team sport athletes. Simon and Martens findings also demonstrated that contact sports elicited higher levels of A-state (as it was measured by STAI) than did non-contact sports. In another study conducted by Krotee (1980) the effects of various physical activity and sport situational settings on the anxiety level of children (ages 7 through 12) participating in a sports fitness programme were investigated. The subjects were administered the State-Trait Anxiety Inventory for children Form C-1 pre and post participation in a specific individual and small group physical activity within sport setting. The children were found to be more anxious in the individual competing situations in three out of four situational pre to post settings. More recently Martens et al. (1990) attempted to test how situational variables influence the competitive A-state components. Male and female college athletes from a variety of sports were employed. The categorization of sport was based on task characteristics of each sport (contact-non-contact; team-individual). The CSAI-2 was completed 1 hour before competition. Results revealed that contact sport athletes displayed significantly higher cognitive and somatic anxiety and lower state self-confidence than did non-

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contact sport athletes. This was also the case with individual and team sport athletes with the former to hold higher levels of cognitive and somatic anxiety but lower levels in self-confidence.

**Hypothesis 2.2.1 :** On the basis of previous research findings, and having in mind that individuals low or high in competitive A-trait will exhibit lower or higher levels of competitive A-state respectively (Martens, 1977; Martens et al., 1990), it was hypothesized that a) contact sport athletes will exhibit higher levels of competitive A-trait and A-state (cognitive, somatic) and lower levels of self-confidence than non-contact sport athletes, and b) individual sport athletes will report higher competitive A-trait and A-state (cognitive, somatic) and lower state self-confidence than team sport athletes.

### 2.2.2. GENDER

Gender differences have been a popular area of research in various fields (Lenney, 1977; Lewko & Greendorfer, 1978; Maccoby & Jacklin, 1974). However this is not particularly evident in the realm of sport where reactions of males and females to competition is an important issue (Hart & Birrell, 1981). The examination of the relationship between competitive trait anxiety and gender has received little attention comparatively to the importance of the issue. The reported findings of various studies however were conflicting. For instance, the general trend from normative data compiled by Martens (1977) during the development of SCAT was that females were higher in competitive A-trait than males across all age groups. Martens findings were supported by the results of the investigation conducted by Krotee (1980). He found that females exhibited a significantly higher

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competitive A-trait level than males prior to participation in the physical activity and sport situational setting. At a later stage of Martens (1977) research, however, new norms indicated that while females were higher in competitive A-trait than males at the youth sport level, the reverse trend was observed for high school and college subjects. In contrast, in their study with elite runners Durtschi and Weiss (1986) found that female runners were lower in competitive A-trait than males. There were also some other research findings which indicated that no significant differences existed in competitive A-trait between males and females (Rainey & Cunningham, 1988).

To understand the relationship between gender and competitive A-trait, researchers investigated the influence of factors such as gender role (Bem, 1974), and motivation (Wankel & Kreisel, 1985). Much of the research on gender role based on Bem's work. She has stated that most individuals possess masculine (e.g. willing to take risks) and feminine (sensitive) personality characteristics which are independent dimensions rather than extremes of a single dimension. Bem also introduced the androgyny term, which is characterised by masculine and feminine characteristics and constructed the Bem Sex Role Inventory to measure individual differences in sex role. Although some of the studies conducted to investigate these relationships give evidence that there is association between the endorsement of the feminine gender role and high levels of competitive A-trait (Anderson & Williams, 1987), in some other studies differences found to be within the moderate range. For example, Segal and Weinberg (1984) investigated the relationship between sex, sex role orientation and competitive trait anxiety. Subjects were males and females undergraduates. All subjects



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completed the Bem Sex Role Inventory and the SCAT. The results of the study indicated that males displayed lower competitive trait anxiety than females regardless of sex role orientation. It must be pointed out however that, although statistically significant, both male and female mean scores for competitive trait anxiety fell within the moderate range. Furthermore, comparison of the means of masculine males versus feminine females indicates a smaller difference. Thus, although sports competition has been identified as a predominately male phenomenon (Kleiber & Hemmer, 1981) this may be decreasing (Segal & Weinberg, 1984). Similar is the view expressed by Hart (1981) who pointed out that the roles of being a woman and an athlete have long been seen, for the most part, as incompatible. As a result, in the past, this role discrepancy has resulted in feelings of stress and anxiety for female athletes. However, it appears that slowly these roles and values are changing and, as Segal and Weinberg (1984) suggested, in the coming years female athletes will feel less and less of a role conflict in sports competition.

In line with this view are the results of field studies conducted by Scanlan and Passer (1978) and Pierce and Stratton (1981). Findings of these investigations indicated that young boys and girls competing in soccer displayed very similar responses to competition in terms of their anxiety levels before and after the game. The researchers noted that the results may reflect the changing sex role socialization patterns over the years culminating in more equal opportunity in sport for males and females.

It has been also suggested that the primary motives, especially when young athletes are concerned, may account for the observed gender

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differences, since young female athletes have expressed a greater interest to the social aspects of sports than males (Gould, Feltz & Weiss, 1985). However, as Brustad (1986) has noted, in recent years girls have more opportunities to get involved with sports and both, girls and boys may view their participation in sport in a similar way. It could be argued however that this must be the case with athletes of high competitive levels. Duda's (1981) research findings appeared to confirm Brustad's observation. She found that young females also attach high importance to sport success as much as males.

The issue of gender differences with regard to competitive state anxiety has received even less attention. The existing findings, however, suggest that there are gender differences in terms of state anxiety. In a cross-cultural study conducted by El-Zahhar and Hocevar (1991) cultural and sex differences in test anxiety were investigated in samples of highschool students in Egypt, Brazil, and the U.S.. Measures of trait anxiety and trait arousability were also included. Results indicated that in all three cultures females reported greater worry, emotionality, trait anxiety and arousability than males. As these researchers pointed out, a clear trend toward greater test anxiety in females emerges in this and most other studies of test anxiety in high school or university students.

In the sport context, Mahoney et al. (1987), in a comparison of male and female athletes, found that non-elite women athletes tended to be more anxious and less confident than their male counterparts. They interpreted this finding on the basis of the cultural and familial influences on women's perceptions of their athletic abilities. On the other hand, the fact that these differences were not apparent at elite

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levels of competition suggests the need for further research into individual athletic careers. Gender differences were also examined in Martens et al. (1990) study. Subjects were athletes from a variety of sports, and they were administered the CSAI-2 one (1) hour before the competitive event. Results demonstrated that females were significantly higher in cognitive and somatic anxiety than were males, but lower in self-confidence than males. In another study, Jones and Cale (1989a) compared male and female university athletes' temporal patternings of competitive state anxiety at six stages prior to competition. With regard to cognitive anxiety the results indicated that females were more anxious immediately prior to competition than males. The results of the analysis of somatic anxiety showed that no gender differences were evident at any of the stages. Self-confidence on the other hand remained stable in the males but decreased in females on the day of competition.

In a recent study Clifton and Gill (1994) employed a feminine type task to assess self-confidence and gender appropriateness in college cheerleading. Questionnaires assessing self-confidence and the gender appropriateness of cheerleading and its five subtasks were administered to college cheerleaders and to noncheerleader college undergraduates. Results indicated that on only two subtasks males possessed as much confidence as females did. Females reported more self-confidence on cheerleading and all other subtasks. Furthermore, cheerleaders of both sexes were aware of the stereotypes held by others, but viewed cheerleading and the tasks within it as more gender neutral than did noncheerleaders.

The literature also suggests that women usually report lower

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levels of self-confidence in sports, as well as other achievement situations, than men (Petruzzello & Corbin, 1988). After reviewing the sport psychology literature on gender, Gill (1992) noted that females typically report lower levels of expectations for success than males do. However, some authors suggest that women do not possess less self-confidence in all achievement situations than men, but that gender differences vary with certain situational variables. Specifically, when gender appropriateness of the task has been considered, women have displayed lower confidence on tasks viewed as masculine (Lenney, 1977).

In order to clear up some of the ambiguous findings surrounding this issue, Lirgg (1991) conducted a meta-analysis of the research on gender differences in self-confidence in physical activity. Coding categories included sex-type of the task, confidence measure employed, and competitive nature of the situation. Lirgg (1991) cautioned that although males were more confident, on average these results were extremely variable and she could draw no conclusion based on this analysis alone. She did, however, find support for Lenney's (1977) contention that the more masculine the task, the greater the gender difference in self-confidence. Finally, Lirgg (1991) concludes that although the overall effect size was not very large, females are not yet equal to males in their stated confidence beliefs.

**Hypothesis 2.2.2 :** Overall, the aforementioned research findings suggest that there are significant gender differences in terms of competitive anxiety. In particular, it is expected female athletes to be higher in competitive A-trait and A-state (cognitive, somatic) but lower in state self-confidence than male athletes.

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### AGGRESSION AND ANXIETY

Although in the sport literature much has been written about anxiety and aggression and their effects on athletes' behaviour, a relationship between them in the context of competitive sport has only been mentioned to a minor extent. In fact, many details are given about athletes's responses to stressful stimuli in competitive situations but whether these stresses result in (anger) aggression is not clearly discussed (Van der Ploeg, 1983).

Thus, the main idea of this study lies in the question: "Is there any relationship between athletes' aggression and competitive anxiety levels?" Specifically, can athletes' anxiety (trait and /or state) be predicted from their aggression levels and/or vice versa? It is hypothesized that athletes' aggression and competitive anxiety are related to some extent and that this relationship might be influenced by variables such as type of sport and gender.

However, looking for studies relevant to the issue of interest in the field of sport psychology, which could be used as a basis for the study of the interrelations between athletes' aggression and competitive anxiety, has proved to be a frustrating task and even a fruitless effort. What could be found so far was only one study which examined this relationship in a sport setting. Thus, the next step was to search for studies conducted by investigators who work in fields other than sport psychology. Therefore, information that implicitly or explicitly indicates a relationship between aggression and anxiety comes from diverse sources, such as, the case of Charles Whitman, a student who began experiencing episodes of intense anxiety. He got into several fights, and in conversations with psychiatrists revealed

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impulses towards extremely violent behaviour (Mednick, Gabrielli & Hutchings, 1984).

Reviewing the literature, only a relatively few studies were found on the importance of the issue which made it obvious that the association between anger or aggression with stress or anxiety was treated as a two-way relationship. Investigators do not attribute causality either, to anger and aggression, or to stress and anxiety. Most of them however examined the relationship between anger and anxiety. This is possibly due to the fact that these two constructs were conceptualized as polar opposites and thus most often contrasted with one another in studies of physiological differences rather than studied for potential interrelations. In the present study, however, the question of interest is about the aggression - anxiety relationship. Bearing in mind that anger can lead to aggression (Averill, 1982), and that anxiety is the cognitive manifestation of stress (Gould & Krane, 1992) it was seemed reasonable to seriously take into account the results of these studies.

Therefore, with one exception, the studies which will be reviewed below took place in areas other than sport psychology (e.g. social psychology) and the basis for the hypotheses concerning the association between aggression and competitive anxiety has come largely from research carried out in these fields. However, whatever the field or the orientation adopted, these studies shed some light on the anger, aggression - stress, anxiety relationship issue.

In short, the purpose of this section is to gather together the literature, and from this, draw out aspects that are most relevant to the issue under study in the sport context. But, before proceeding with

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a review, the sport context within which aggression and anxiety are generated will be described first.

### THE COMPETITIVE SPORT SITUATION

If behaviour is to be predicted with greater accuracy then the situation in which the behaviour is expressed should be taken into account (e.g. Mischel, 1973). This need has especially been emphasized by Magnusson and Stattin (1982) who, in connection with the growing research on person by situation interaction noted that most researchers in the field of stress and anxiety accept an interactional point of view (Laux & Vossel, 1982). In this study, the sport situation in both training sessions and actual competitions formed the frame in which individuals expressed themselves.

Because of the importance of sport in society as well as the competitive element that is involved in sport form activities (Gill, 1986), sport situations have the capacity to elicit (intense) psychological reactions, especially if individuals place considerable importance upon achieving success in sport. The competitive sport environment provides a natural laboratory in which to study behaviour, and stress-related behaviour in particular. Top level sport, by its very nature, is highly visible and competitive (Jones, 1991). The competitive forms of sports seems to be characterized by an increased tendency towards violence (Leith, 1989), and, in comparison with the past, the official rules are considerably "dampened" as far as violence and aggression are concerned (Pilz, 1979). This is due to the fact that sports have become professionalized. As a consequence success in sports and the rewards for success become more and more overvalued and

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conversely, the disappointments associated with failure are often great (Jones, 1991). Where victory and success are deemed to be the highest values, their attainment authorizes illegitimate means (Pilz, 1979). In many competitions the rivals actively interfere with each other's progress toward the goal, and this interference could bring about feelings of frustration (Biddle, 1995). When the contestants realize that their opponents might deprive them of the prize (or outcome) they desire, this anticipated obstacle/frustration could give rise to aggressive inclinations.

Studies have repeatedly shown that competition is likely to produce hostility and aggression rather than friendship. Moreover, this antagonism can arise even when the competition is legitimate and the rivalry takes place within established rules of conduct (Bernstein et al., 1994).

Sherif and Sherif's (1969) investigation<sup>15</sup> with youngsters has given us one of the best-known demonstrations of competition's negative effect. Berkowitz (1993) noted that even adults both men and women, can become seriously antagonistic and aggressive toward those with whom they compete for scarce resources.

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<sup>15</sup> The investigation was conducted at an isolated boy's camp with middle-class youngsters and divided into three stages. In the first phase, campwide activities were carried out so that the researchers could determine which boys were friends. These friendships were then deliberately broken up in the second stage. The youngsters were divided into two groups by assembling them with others for whom they had previously shown little liking. The two newly formed groups were kept separate during this second phase, so that the boys in both groups developed fairly close ties. In the last stage of the experiment, the two groups competed with each other in a series of games, for attractive prizes. The boys did not resume their earlier friendships in these contests; instead, they were openly hostile toward the members of the opposite group, whom they now treated as rivals. As the games continued (and the frustrations were repeated) the rivalry occasionally flared into open aggression. Competition had apparently led to hostility and aggression. Enmity overrode the friendships that had previously existed.



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A considerable body of laboratory research also confirms that the competition apparently generates aggressive inclinations in adults (Worchel, Andreoli & Folger, 1977) and youngsters, even though when the rivalry is a fair one and follows accepted rules (Berkowitz, 1993).

What seems crucial in social experiences of athletes' competition is that competition tends to both reduce the frequency of prosocial behaviour and increase antisocial behaviour. The literature does not clearly indicate the mechanisms through which competition is hypothesized to constrain moral behaviour. Two hypotheses seem reasonable: First, when competition is treated as a struggle against others, it concentrates the attention of an individual on its own ego, that restricts the power of other values. The excessive competition can decrease sensitivity to the needs and interests of others, particularly opponents, and lead to conviction that success (own success) is the highest value. At the same time it arouses the feeling of threat, that -inturn- again increases the tendency to ego concentration. It seems obvious that ego-centered personality cannot promote moral growth (Mikolajczyk, 1993; Shields & Bredemeier, 1995). A second mechanism through which extensive competitive experience may impede prosocial behaviour is by influencing participants' attributions of others motives (e.g. competitive orientations) (Shields & Bredemeier, 1995).

Emotional reactions to stress can be observed in almost all spheres of human activities and are invariably present in competitive sports, especially in championship competition where valuable rewards play an important role, and the pressures of competition are very high (Man et al., 1995). As mentioned above, research findings demonstrated that, the competitive situation has the potential to elevate

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(precompetition) stress levels (El-Naggar, 1993; Scanlan & Passer, 1978). Santomier (1983) has pointed out that the intensity of (stress) reactions depends upon how competitive sport situations may contribute to: disrupting or endangering one's important goals and values; creating uncertainty about one's physical survival; threatening the maintenance of one's identity; or affecting the ability to control one's environment. Other factors which can contribute to a threatening situation by producing varying degrees of anxiety from a "base level" are: perceived difficulty of the task, concern about readiness to perform, strength or skill of opponent(s), the importance of a specific competition, potential negative evaluations from others, or the social consequences to one's self and/or to team in general if the performance is less than adequate. Thus, socially related or derived threats to the athletes may cause excessive anxiety (Cratty & Hanin, 1980).

The fact that sport combines physical, psychological and social stressors in an integrated form makes it a unique situational stressor. Moreover, environmental stimuli might add more pressure on the athlete who will react to this situation with a variety of physiological, psychological and social responses. The way the individual athlete will react depends on his/her coping resources (Cohn, 1990; Santomier, 1983). In competitive sport situations individual differences can be more striking than in other environs. Thus, one can observe that some athletes are in a state of panic, others trying to gain control of the situation whereas some others keep the situation under control making their own game. When an individual appraises the situation as *dangerous* or *harmful*, physiological arousal results in an effort to cope with it (Cohn, 1990). In other words, competitive sport situations can be

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either appraised as exciting and challenging events by some participants or as threatening, possibly harmful and/ or provoking ones by some others. High arousal levels are common in sport since arousal is increased in expectation of an exciting event as well as in a threatening situation (Gill, 1986). Each of these appraisals can lead to a different set of particular kinds of actions and emotions. An event perceived as challenging tends to evoke instrumental activities and is generally associated with productive arousal. An appraisal of threat tends to evoke anxious arousal, whereas an appraisal of harm or loss tends to evoke anger. It is also true that, the competitive situation itself is likely to heighten the arousal level of an individual to some degree even without the occurrence of a disturbing incident. It should be noted that, although many incidents in sport provoke or anger athletes, those conditions do not necessarily elicit aggression. As Berkowitz (1974) and Bandura (1973) propose, whether or not individuals actually behave aggressively depends on the situational cues and the responses that have been learned and reinforced.

In summary, the competitive sport environment is a unique situational stressor. As it is known, stressors are just one of the many factors that underlie human aggression. Stressful environmental conditions can create enough arousal to make aggressive behaviour more likely (Bell, 1992). Precompetitive sport situation in particular has the potential to elevate stress levels. Among the causes of precompetitive anxiety is the fear of failure, loss of control, and most important, anxiety may be produced as a result of frustration of motives (Fogiel, 1994) which also may constitute the starting point for aggressive behaviour as well. Therefore, in the (competitive) sport

context there are a number of situations which will be experienced as anxiety-arousing and/or aggression arising. As Van der Ploeg (1983) stressed, there are a number of situations which usually result in combination of anxiety and aggression reaction tendencies, such as frustration and blocking of goal directed behaviour, not being given appropriate recognition (e.g. by coach, spectators, or other significant others), criticism, bad calls (see blending of emotions section), etc.

Since arousal appears to be an integral part of the competitive situation it warrants a more extensive discussion. The following subsection deals with this issue.

#### AROUSAL

The concept of arousal<sup>16</sup> (known also as excitation and activation) was first proposed and developed as a physiological variable (Russell & Mehrabian, 1974) which centered on the notion of energy mobilization during threatening situations (Weinberg, 1989).

Duffy (1957) was among the earliest supporters of arousal. Her concept of energy mobilization together with Malmö's (1959) notion of a continuum of arousal underlying behaviour developed the idea of

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<sup>16</sup>In an attempt to define the nature of arousal by avoiding the use of physiological terms, Epstein (1972) proposed a set of assumptions. Some of the major ones are the following:

- 1) In order to survive, organisms must maintain their level of excitation (arousal), no less than their other internal states, within homeostasis limits.
- 2) Small increments in arousal produce alerting reactions.
- 3) Large increments in arousal are experienced as unpleasant and produce defensive reactions.
- 4) High levels of arousal are produced by any strong stimulus or emotion, not only by anxiety. The organism, to defend itself against high arousal levels resorts to biological defences if psychological or behavioural ones are inadequate.

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general activation or arousal (Cooke & Alderson, 1986). In particular, they viewed behaviour as varying on two dimensions (direction and intensity) with arousal being the intensity dimension of behaviour and was defined as "the extent of release of potential energy, stored in the tissues of the organism, as this is shown in activity or response" (p. 17; Duffy, 1962).

The construct of arousal came to replace confusing concepts such as emotion, and drive since it appeared as unidimensional and readily quantifiable. In addition, it offered the simplicity that was lacking in theories of emotion (Neiss, 1988). According to Oxendine (1980), describing emotion on the basis of level of arousal or activation was the most useful approach. Thus, as a broad concept, arousal includes reactivity to all sources of inner and outer stimulation encompassing negative and positive emotions (Epstein, 1972). It is often treated as a variable which possesses motivational, emotional and cognitive properties that determine the functioning of the whole human being (Parkinson, 1988).

Cox (1990) has pointed out that a fuller understanding of arousal can be achieved if the basic changes which take place in the body, when the organism is activated, can be understood. For this reason, a brief description of the nervous system is presented in Appendix 2.

To assess arousal, a variety of measures were used (Weisse et al., 1989). Arousal thus is assessed from questionnaires, behaviours, activity levels in the brain and from physiological activity in the periphery. The question posed, however, was whether behavioural, cognitive and physiological arousal states reflect the same phenomenon. The view of arousal as activation supposes that all psychophysiological

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measures reflecting activation represent arousal and are therefore interchangeable variables. However, as research in psychophysiology and neurophysiology became more sophisticated the unidimensional conceptualization of arousal began to lose favour (Neiss, 1988; Weisse et al., 1989). Lacey (1967) was one of the first to disagree with activation theorists and argued that arousal is multidimensional in nature. He further argued that "if dissociation could occur between behavioural and psychophysiologic arousal, a unitary approach was inadequate" (p. 286). He also described situations where some indicators used to measure autonomic arousal indicated heightened activity, whereas another measure indicated simultaneously low arousal (Landers, 1980).

Further, the position taken by several researchers was that, the construct of generalized arousal seemed effective in explaining the transition from sleep to wakefulness but misleading at more intense behavioural levels as an all-purpose explanatory power (Neiss, 1988; Weisse et al., 1989). According to Neiss (1988), this notion continued to gain support from areas such as cross-cultural emotion recognition, facial EMG, biochemistry, learning and factor analysis of mood states, challenging the unitary conception of arousal. Following, a brief review on this issue which has caused serious controversies/arguments will be presented under the heading specificity.

### SPECIFICITY

Whilst a discussion on specificity issue is beyond the scope of such a study as the present one, I should like to review some of the studies that fulfil two purposes. First, the unsettled question of the

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Autonomic Nervous System (ANS) physiological specificity is linked with the construct of physiological arousal and this state of affairs is reflected in research on sport psychology. Thus, by briefly outlining the problem, it will help a better understanding of the reasons which have prevented research from producing conclusive results; and secondly, the construct of arousal is linked with both anxiety and aggression and has influenced research on these psychological states in sport. In addition, this knowledge, will enable us to see clearly whether a relationship between aggression and anxiety in the sport context is possible, and to what extent, so that to base our expectations on a realistic basis.

A major debate between theories of emotion was whether different patterns of autonomic nervous system responses correspond to different emotions or a common set of physiological processes underlies all emotion. This problem that is known as *specificity* position has arrayed researchers' viewpoints in opposite sides. Since the 1950s these extreme positions stimulated a number of experimental studies which attempted to identify some of the autonomic patterns (Kemper, 1978). This problem was first posed by Lange (1885) and James (1884) in their classic work of the nature of emotions (cited by Rosenzweig & Leiman, 1982). James suggested that there are a large number of patterns of ANS activation and each of them is associated with a different emotion. In other words, emotions such as fear, anger, etc. are experienced when there is an awareness of the bodily changes, and thus, different emotions are associated with different physiological responses. About the same time Lange proposed a similar view. The James-Lange theory which emphasizes peripheral physiological events in emotion, initiated

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many studies that attempted to link emotions with bodily responses (Rosenzweig & Leiman, 1989).

The James-Lange theory was strongly criticized by Cannon (1927, 1929; cited by Schachter, 1964) who argued that high-intensity *undifferentiated* sympathetic arousal accompanied all emotions. Specifically, the notion of arousal was incorporated in Cannon's (1914; cited by Weisse et al., 1989) early work, referred to as an emergency response. According to Cannon, physiological arousal prepared an organism to cope with stressful or emergency conditions either as a fight or flight response. Cannon suggested that stressful experiences could be characterized by a state of arousal or increased activity of sympathetic nervous system that can be expressed in many ways including an increase in heart rate, blood pressure, and respiration. Arousal therefore was highlighted as the major constituent of stress and at the same time emotional stress was defined in terms of sympathetic arousal. In this approach stress was treated as a physiological response and its underlying assumption was the *non-specificity* that dominated in the stress models developed by the advocates of this approach (e.g. Selye, 1956; in Weisse et al., 1989).

The notion of undifferentiated arousal played a major role in the influential cognitive-physiological theory of Schachter and Singer (1962). According to Schachter and Singer "undifferentiated arousal is a necessary precondition for emotion - an extremely plastic medium to be moulded by cognitive processes working in concert with the available cues from the social environment" (p. 19).

Schachter and Singer (1962) tested the theory experimentally by injecting epinephrine to induce arousal in three groups and injecting



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a placebo in a fourth. Then, they manipulated the cognitive input by giving accurate, inaccurate or no information about the arousing effects of the drug (e.g. increased heart rate). According to Schachter and Singer (1962) subjects unaware of the stimulant properties of the drug interpreted their physiological symptoms as being due to the situational factors and experienced the emotion of anger or euphoria when provided an appropriate psychological context. The theory states that emotional states may be considered as the interaction of cognitive factors with a state of physiological arousal. In other words, emotional states are characterized by an undifferentiated state of arousal, and a cognition which determines whether the state of physiological arousal will be labelled and experienced in one of several ways (as anger, joy, or whatever).

Schachter's (1964) two-factor theory is one of the most influential theories of emotions. The main propositions of this theory, as stated by Schachter are presented in Appendix 3.

Schachter's theory has not survived critical assessment. According to its critics, the theory presupposes rather than explains arousal which can be experienced as different emotions according to cognitive circumstances (Averill, 1982; Manstead & Wagner, 1981; Zillmann, 1983). The most significant, however, is the fact that reported replications of Schachter and Singer experiment failed to support its findings (Izard, 1991). Even more important perhaps is that Schachter and Singer's own results do not support the theory.<sup>17</sup>

The studies conducted to test the specificity and non-specificity

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<sup>17</sup> Professor H. Wagner's (University of Manchester, Department of Psychology) comments on this piece of work.

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position resulted in findings favouring both sides. In these studies of physiological differentiation the emotion most often employed was fear (or anxiety) which was usually contrasted with anger (Shields, 1984). Since both, the aim and methodological approach of these studies is different from the one used in this study, only a brief reference to the evidence supporting both the ANS specificity and undifferentiated arousal theory will be made in Appendix 4. More details could be found by the interested reader in Kemper (1978) and Wagner (1989).

Several other studies have also demonstrated physiological differentiation among the fundamental emotions of sadness, fear, happiness, and anger (Schwartz, Fair, Salt, Mandel & Klerman, 1976; Schwartz, Weinberger & Singer, 1979; Weerts & Roberts, 1976).

As far as it is known, more recently, undifferentiated arousal theory has received (partial) support, as Kashani et al. (1991) contend by their study. Specifically, Kashani et al. examined the relationship between aggression and anxiety employing subjects of 7, 8, and 17 years old. As they noted, the most important finding of their study was that aggression is one way of dealing with fears and anxieties. Their conclusion derived from the significantly higher means anxiety level among subjects in the high aggression group (both verbal and physical). They further stressed that this finding provides partial support to Cannon's (1929) notion that involves the perception of a dangerous or threatening environment that initially produces anxiety and, in turn, may lead to aggression or the "fight" response (Kashani et al., 1991).

It is interesting to note however that, some of the studies reported in support of the unidimensional arousal theory (e.g. Levi, 1975; Frankenhaeuser & Rissler, 1970) (Appendix 4) have been critically

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examined by reviewers such as Kemper (1978) who argued that these studies give support to the specificity rather than to against-specificity hypothesis.

Bandura (1988) expressed the view that different types of emotions are characterized by extensive similarities in autonomic arousal and hormonal secretions. The physiological undifferentiation "overshadows" any small differences that may appear. He further assumed that the failure of research to replicate the differences across different studies or different ways of inducing emotion can be attributed to uncontrolled factors such as variations in the intensity of the emotion instigators which covary with emotion induction. Thus, according to him "even if the nuances were reliably established, it is doubtful that they would be sufficiently distinguishable in an otherwise common elevated pattern of physiological arousal to serve as the cues specifying the experienced emotion" (p. 78).

Several other investigators are in agreement with Bandura in the sense that they acknowledge that the complexity of the issue itself as well as a number of methodological problems involved in studying emotions and ANS activity during emotional experience were in part responsible for the inconsistent results. Other factors apart from the intensity variations which contributed to the difficulty of physiologically differentiating the various emotions are the baseline, timing, and verification of emotions (Levenson, 1988; Kemper, 1978). In the context of arousal research in particular, individuals variability of specific responses of various bodily systems to different stimuli is characterized by Neiss (1988) as the chief factor. Variability has demonstrated by Lacey and Lacey (1970) who referred to this

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characteristic as individual response stereotypy.

The study of Ekman, Levenson and Friesen (1983) is an excellent example that illustrates the degree to which the aforementioned problems can affect the research findings. Using professional actors as subjects and scientists who studied the face, six emotions were studied from facial behaviour recordings and physiological measures. Employing the verification criteria, Ekman et al. (1983) were able to distinguish among negative emotions (e.g. anger distinguished from fear and disgust) providing supportive evidence for the autonomic differentiation of emotions.

The important role advances in technology and other methodological improvements played in distinguishing not only between positive and negative affects but also between negative emotions has in particular been stressed by Neiss (1988). According to Neiss (1988), in support of specificity come findings from recent neuropsychological investigations which tend to emphasize differences between the hemispheres of brain suggesting for example that "arousal is externally oriented, located primarily in the right hemisphere and parietal regions, and controlled by noradrenergic neurotransmission, whereas activation is internally oriented, associated with the left hemisphere and frontal regions, and controlled by dopaminergic transmission" (p. 353).

Further evidence against the unitary conception of arousal is provided from biofeedback research (e.g. Frost et al., 1978). Research in this area has also identified variables that are correlates of autonomic and somatic patterns of response. These variables include age, gender, other demographic data and personality characteristics

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(Neiss, 1988).

In order to demonstrate the extremity of the position taken by Schachter and Singer that emotions are generalized arousal plus cognitions about a given situation, Neiss (1988) paralleled the psychological context in which Schachter and Singer's subjects were placed to the motor performance context by means of an example. Applying in turn his example to a sport competitive situation it would be said that, athletes who are about to engage in a subjectively important competition are in a somewhat similar position to subjects in Schachter and Singer's experiment. First of all, the importance of competition guarantees physiological elevation and some of the following emotions could be experienced: excitement, enjoyment, fear, guilt, anger, surprise, contempt, distress, etc. According to Schachter and Singer (1962) then these are all the same physiological state which are labelled differently by the individual athletes. But, as the existing accumulating evidence suggests, these are discrete emotions. Neiss stressed that he does not deny the importance of cognition, because cognitions, such as appraisals, are components of the emotional experience and can affect the subsequent emotion. He only denies to assign primacy to cognition because cognition affects emotion and emotion affects cognition as well. His viewpoint falls between the two as he makes it clear with the statement that "neither cognition nor affect regularly causes the other, but their interaction and interdependence suggests the need to investigate them conjointly as psychobiological states" (p. 357).

In recent years, however, and despite of the fact that the ANS specificity theory has received support in fields such as

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psychophysiology and sociophysiology, the undifferentiated arousal theory has been dominant (Kemper, 1978; Levenson, 1988).

Currently, relatively few attempts have been made for further elucidation of physiological patterning of emotions. According to Roberts and Weerts (1982), the reasons that could account for this relative dearth of studies regarding the hypothesis of emotional specificity are mainly a) due to the great influence of reviewers such as Cannon and Schachter who "have played down existing experimental evidence supporting the concept of physiological differentiation in emotion, dismissing demonstrated differences in patterning as small in magnitude and therefore unconvincing" (p. 220), b) because of the strategy adopted to induce emotions in the laboratory by using "standard" stimulus situation and employing heterogeneous groups of subjects. This strategy, however, disregards individual differences in emotional response and coping behaviour. In addition, such extreme manipulations as threat to the point of terror, or application of noxious physical stimuli, raise ethical concerns (Levenson, 1988).

Thus far theoretical positions and research findings have been reviewed. Although the existing evidence favours the specificity theory, conclusive results have not been produced. Thus, the subject is still open awaiting for further research. What are the implications of the existing research findings however to the present study? It became quite obvious that the generalized arousal theory is not sufficient to account for complex emotional states /phenomena as the ones generated in the sport context and in particular in competitive situations. On the other hand, many of the investigators and supporters of both theories (specificity and undifferentiated arousal theory), employed

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anxiety or fear and anger in their experiments as (polar) opposites. This treatment however implies that, these emotions are not related and therefore such a relationship should not be expected. In actual fact, none of the theoretical positions reviewed as they stated would support a relationship between aggression and anxiety. At this point, evidence which comes from another approach suggests otherwise. However, before presenting evidence supporting the notion that there is relationship between the two and therefore it is possible to predict one psychological state from the other, the role of arousal in aggression and anxiety will be discussed first individually.

### AROUSAL AND AGGRESSION

The arousal concept as has been employed in contemporary research studying human aggression has two precursors which are the construct of drive<sup>18</sup> and the construct of activation (Zillmann, 1983).

A specific application of drive theory (Hull, 1943) to aggression was made by Brown and Farber (1951). According to this application the energy mobilized by the instigation to aggression is expected to potentiate aggressive and non-aggressive responses that are evoked by specific environmental cues.

Activation on the other hand was viewed as a non-specific, energizing force that encompassed all behaviour. The concepts of activation and generalized drive have therefore the same implications

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<sup>18</sup>The reasoning of aggressive drive was influenced by behaviour theory. Hull (1943) proposed a non-specific, undifferentiated drive state that integrates components of drive from other related or independent sources. The combined strengths of active drives were expected to energize behaviour that, at the time, was prepotent in the habit structure. Thus, any behaviour could be facilitated by energy (drive) that in the past has not been associated with the behaviour in whose energization it participates.

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for the energization of behaviour (Geen & O'Neal, 1969). Their difference lies at the operational level, that is, while drive remained a hypothetical construct that can be assessed only indirectly (e.g. behavioural vigour), activation or arousal could be measured directly using physiological measures such as electroencephalogram. For this reason the concepts of generalized drive and arousal were treated as interchangeable. Moreover, since arousal could be measured reliably, assessment of drive through arousal was widely acceptable (Zillmann, 1983).

General arousal as a facilitator of aggression has been an issue that has drawn the attention of theorists who represent different theoretical formulations. However, as Zillmann (1983) has noted, although the concept of arousal was incorporated in most theories of aggression, only a "highly qualified version" of the concept has been adopted. In Berkowitz's theory, for instance, where the focus has been on the role of frustration and eliciting cues, arousal was merely a component of anger and any stimulus that enhances arousal in conjunction with aggressive cues may generate impulsive aggressive reactions (Rule & Nesdale, 1976). Berkowitz on the basis of findings from a number of experiments conducted by him and his colleagues (Berkowitz & Geen, 1967; Berkowitz & LePage, 1967; Geen, 1968) proposed that, prior attack or frustration produces general arousal which in turn increases the probability to aggression in a specific situation.

Geen and O'Neal (1969), having as basis activation theory (Malmo, 1959), predicted that possibly any sensory input can create a sufficiently high level of arousal to energize latent responses to aggressive cues. They tested their hypothesis with male subjects who



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witnessed either an aggressive boxing film or exciting non-aggressive sporting activities and then delivered electric shocks against another person. During such time subjects either were stimulated by white noise, the arousing stimulus, or were not so stimulated. The results showed that subjects who had seen the boxing film and had received noise manifested the greater degree of aggression. They concluded that, their findings are in line with Berkowitz argument that general arousal facilitates the expression of aggressive responses to aggressive stimuli. However, as the same investigators rightly noted, existing evidence suggests that aggression may not be a unitary concept, and therefore the view they expressed cannot account for all aggression.

Bandura (1973) has also employed the arousal concept to predict the intensity of both aggressive and non-aggressive reactions. In his reasoning, "arousal deriving from the instigation to aggression is likely to energize non-aggressive behaviours as well as aggressive reactions, and analogously, arousal deriving from non-aggressive stimulation may energize aggressive behaviour" (p. 78). Bandura (1973) specifically asserted that aggression either can occur in the absence of an emotional state or may be facilitated by aversive stimuli such as attack, environmental stress, or goal blocking through its arousing properties. In other words, for him, arousal, modelling cues and other stimuli can combine to produce increases in aggression (Rule & Nesdale, 1976). However, Bandura expects arousal stemming from joyful or rewarding experiences to inhibit rather than to facilitate aggression (Zillmann, 1983).

Thus, it appears that, in spite of the different theoretical orientation adopted by the major theories of human aggression a)

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arousal was treated as a hypothetical construct, analogous to generalized drive; b) arousal was viewed as a behaviour-energizing force selectively applied and not as an diffuse and universal force; c) arousal combined with aggressive cues can increase aggression (Zillmann, 1983).

Nevertheless, the emergence of the arousal concept in the study of aggressive behaviour can be traced back to early studies (e.g. Cannon, 1929; Schachter, 1964). Research on the aggression-arousal relationship has been in particular influenced by the conceptualization of arousal in Schachter's (1964) two-factor theory of emotion and especially from the conceptual separation of excitatory and cognitive processes, which entered in research on aggression-arousal relationship in various forms (see Zillmann, 1983). As it has been noted previously, Schachter's theory was criticized for not only being too cognitive (Averill, 1982), but also because Schachter had not suggested any "real-life" situations where arousal was not completely congruent with the interpretation of the situation (Parkinson, 1988).

Zillmann (1979) attempted to correct this omission and proposed a three-factor theory of hostility and aggression that is a specific application of his three-factor theory of emotion to the arousal-aggression linkage. This approach integrates the two-factor theory of emotion (Schachter, 1964) with behaviour theory (Hull, 1943; Spence, 1956). Zillmann argued that arousal can derive from a combination of factors but is usually attributed to only a single one. He also presented evidence for the phenomenon of excitation transfer. Accordingly, arousal originated from one source can be transferred to a new source when individuals no longer associate their arousal to the

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primary source (Zillmann & Bryant, 1974). For example, Bryant and Zillmann (1979) conducted a study in which the opportunity to aggress was delayed for one week. It was found that the intensity of aggression, that was delayed for one week, was nonetheless proportional with the magnitude of residual excitation transferred into provocation. This investigation showed that arousal is of no consequence in the aggressive behaviour of unprovoked persons. The explanation given by these investigators was that the intensity of annoyance and the retaliatory plans may be stored in memory and recalled at a later time. However, as they pointed out, at the present, there are no data to support this assumption.

Averill (1982), after reviewing the literature, concluded that one of the most common assumptions in contemporary theories of emotion is that "physiological arousal from diverse sources may combine to enhance whatever emotional experiences and responses might occur in a given situation" (p. 131).

Several studies (e.g. Hokanson & Burgess, 1962) have shown that arousal increased as a function of provocation that can take the form of ego-threat, goal-blocking, and generally as a threat to the individual's well-being. Thus, it appeared likely that, strong provocation produce higher levels of arousal which in turn intensify aggressive behaviour. Yet, Zillmann (1983) has noted that such correspondence in levels of provocation, arousal and aggressiveness does not necessarily mean that causality can be attributed to arousal for the intensification of aggression.

Several studies were conducted in order to explore the facilitation of aggression through the generation of varying levels of

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arousal unrelated to provocation (Cratty, 1981). For example, in Geen and O'Neal's (1969) study with male subjects, where arousal produced during performance, the facilitation of aggression through produced arousal was examined. They found that aggressiveness, as measured by the frequency of shock delivered, was higher in the white noise condition than in the control. Similar studies (e.g. Konecni, 1975) were also supportive to the facilitation of aggression through arousal.

Zillmann (1971) attempted to investigate the facilitation of aggression utilizing alien residual arousal from stimulation preceding the performance of aggressive acts. Male subjects were first provoked, then shown one of three kinds of films (travel scenes, prizefight, erotic) designed to induce physiological arousal, and then provided with an opportunity to retaliate. Retaliation was measured in the intensity of electric shock delivered to the annoyer. The results indicated that aggression was facilitated in proportion to the residual arousal from prior stimulation.

Zillmann, Katcher and Milavsky (1972) provided also supportive evidence for the interaction of provocation and arousal in the facilitation of aggression through arousal. In one study, subjects were aggressively instigated (low vs high) and aroused (low vs high) by means of physical exercise. It was found that subsequent aggressive behaviour, as measured by the intensity of shock delivered to the instigator, was significantly increased with initial instigation and also with residual sympathetic activation from strenuous exercise.

These findings were further supported by other studies conducted by Zillmann, Johnson and Day (1974a, 1974b). They found that physiological arousal induced by physical exercise did not increase

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aggressive behaviour if the individuals knew that their increased arousal was due to exercise. Zillmann et al. concluded that when increased arousal clearly stems from exercise, competition, noise, or other sources unrelated to aggression, individuals do not become more aggressive. But when the source of arousal is not easily identified the arousal may be labeled as anger or irritation, and may increase aggressive behaviour (Gill, 1986).

According to Cox (1990), these results suggest that higher levels of aggression should be expected in sports that involve the most physiological arousal. Thus, athletes of team sports, such as basketball, handball, would be more prone to violence than athletes of other sports such as cricket, volleyball. But, as the results from the aforementioned studies suggest, in the absence of a provocation to anger, increased physiological arousal has only a little influence on aggressive behaviour (Averill, 1982). Therefore, is not the level of arousal the critical factor for energizing aggression, because energization is not necessarily in proportion to prevailing levels of arousal. It is rather a set of circumstances under which arousal can operate (Zillmann, 1983).

In short, the existing evidence showed that a) arousal does not indiscriminately energize aggressive behaviour, and b) arousal is likely to intensify aggressive behaviour only under provoking conditions (Zillmann, 1983).

### AROUSAL AND ANXIETY

As mentioned in the previous section, in the psychological literature and in particular in the area of motor performance, the

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concept of arousal has been closely associated with emotional constructs especially with fear and anxiety, and in fact, these terms have been often used interchangeably by many authors (Weinberg, 1989). This assumption however, not only cannot be supported on conceptual grounds, but, in addition, has led to conceptual confusion. As a result of this treatment, measures of arousal were perceived as good indices of anxiety (McReynolds, 1976). Specifically, anxiety is viewed as an observable manifestation of arousal (Cooke & Alderson, 1986). According to Sonstroem (1984), however, arousal actually refers to the entire continuum of an individual's psychological activation whereas anxiety is held to occur towards the higher arousal states that produce feelings of discomfort or excessive concern.

An extreme position was taken by Epstein (1972) who defined anxiety in terms of arousal associated with the perception of danger and, in essence, in his view the significance of anxiety was its tendency to increase arousal.

McReynolds (1976) stressed the necessity to arrive at a plausible account of the relations between anxiety, as a mental state, and those physiological variables labelled as "arousal." He also argued that a person can have high anxiety without being highly aroused, and that the opposite is also true. To support his contention, McReynolds presented the results of a number of studies on the relations between measures of trait anxiety<sup>19</sup> and levels of arousal<sup>20</sup> under non-stressful, resting level conditions in normal subjects. According to the results, the

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<sup>19</sup>Measures of trait anxiety: Taylor Anxiety Scale (MAS), IPAT anxiety scale.

<sup>20</sup>Measures of physiological arousal: Palmar sweat, diastolic blood pressure, systolic blood pressure.

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relationship between the two classes of measures appeared to be close to zero. He noted that these results, though paradoxical, can be interpreted only by distinguishing between characteristic (trait) anxiety on one hand and induced (sudden)<sup>21</sup> anxiety on the other hand. He further concluded that, the relationship between arousal and anxiety is more complex than initially thought, and might be summarized by the following generalization: "the arousal system responds positively to increments in anxiety, the more sudden the increment the greater the response, but once the level of anxiety has reached an equilibrium, even though it is still high, the level of arousal tends to return to its normal baseline. Arousal, in other words, is a crisis reaction to upsurges in anxiety, but is not a correlate of the level of anxiety" (p. 72).

Russell and Mehrabian (1974) on the other hand have pointed out that the existing physiological evidence, while tentative supports the involvement of high levels of arousal in anxiety. According to them, anxiety has been shown to correlate with a variety of arousal cues (Cattell, 1966; DiMascio, Boyd & Greenblatt, 1957; Malmö, 1957).

Against the prevalent notion that arousal is equivalent to fear and anxiety come findings from some studies which demonstrated that fear and anxiety have only low correlations with measures of global arousal (Mewborn & Rogers, 1979).

It appears therefore that the main reasons for using the arousal in the psychological literature no longer exist since the body of research evidence suggest that arousal is neither unidimensional in nature nor equivalent to fear and anxiety (Neiss, 1988).

In early research before the development of sophisticated

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<sup>21</sup> Induction procedure of sudden anxiety: role playing, film, ego threat, doctoral orals.

Measures of arousal: EMG variables, skin temperature, palmar sweat, autonomic balance.

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physiological recording apparatus, arousal was often assessed from overt behaviour with task performance being the behavioural framework for the assesment of arousal states (Weisse et al., 1989). Arousal has also been used as an explanatory concept in drive<sup>22</sup> theory and the inverted-U hypothesis<sup>23</sup> (Yerkes & Dodson, 1908; cited by Sonstroem, 1984; Jones, 1990).

Levitt (1980) has pointed out that little conclusive work has been registered and the arousal-anxiety (or otherwise physiology of anxiety) subject remains open to research. More than one decade later, and although some steps forward have been made, the issue still remains open awaiting for further research.

This subsection will be concluded with the description of a conceptual model presented by Gould and Krane (1992) for integrating arousal construct terminology (Figure 2.3). In particular, the aim of this model was to eliminate the confusion caused by the inconsistent usage of arousal related terminology. The central construct of the

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<sup>22</sup>Drive for Hull (1943) who initially advanced the drive theory, was a global, non-specific energizer of all behaviour and has been equated in the literature with the construct of arousal. The theory assumes a positive, linear relationship between arousal and performance on well-learned tasks. Drive theory has received scant empirical support and since it was seen inapplicable to studying more complex motor behaviours in sport, it was abandoned from the majority of researchers (Neiss, 1988; Sonstroem, 1984).

<sup>23</sup>The inverted-U hypothesis has emerged as an alternative model of the relation between unidimensional arousal and performance. The origins of this hypothesis can be traced back in the early work of Yerkes and Dodson in 1908 (Jones, 1990). The inverted-U hypothesis predicts that increases in arousal are associated with improvements in performance up to an optimum level, where upon further increases in arousal will lead to decrements in performance (Landers & Boutcher, 1986; Sonstroem, 1984). This theoretical framework formed the basis of Oxendine's (1980) proposition for a relationship between arousal and motor performances a function of task characteristics. According to Neiss (1988), the inverted-U hypothesis has received weak support and has received strong criticism (e.g. Hardy, 1990; Jones, 1990; Kleine, 1990; Weinberg & Ragan, 1978).



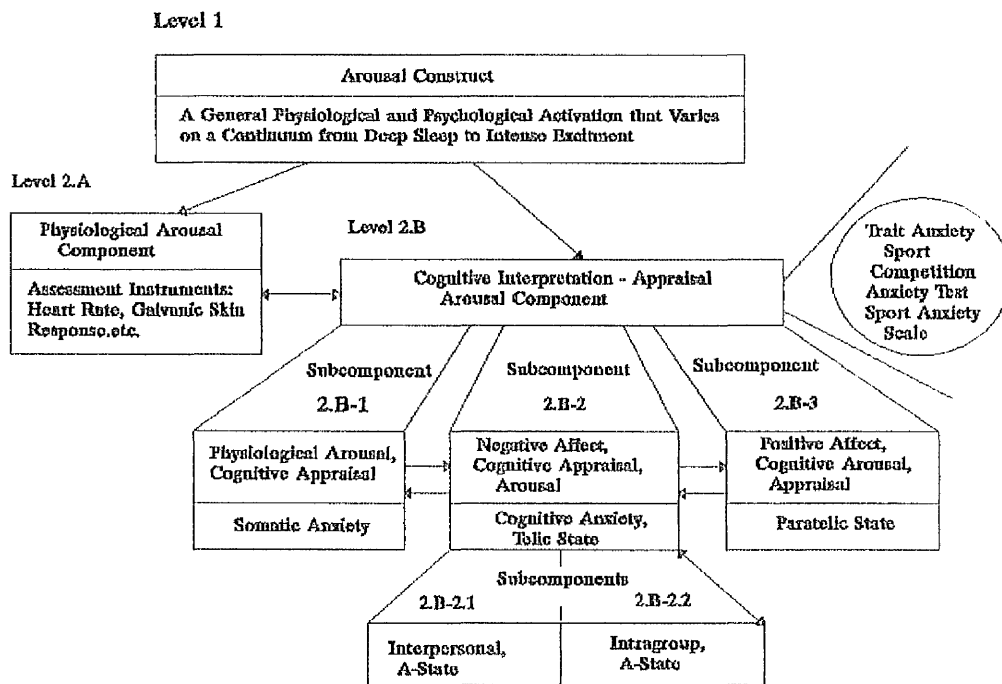


Figure 2.3 : A conceptual Model for Integrating Arousal Construct Terminology (Adapted from Gould & Krane, 1992).

model is arousal (Level 1) and is defined as a physiological and psychological activation of the organism. At the Level 2 of the model arousal is differentiated between a physiological component (Level 2.A) that is assessed via measures such as heart rate, respiration, skin conductance, and a cognitive interpretation-appraisal component (Level 2.B). The cognitive component is subdivided into three subcomponents, which are: somatic state anxiety (Level 2.B-1), cognitive state anxiety or telic state (Level 2.B-2), and a paratelic state (Level 2.B-3). The somatic state anxiety is defined as the athlete's perception of his or her level of physiological arousal, The cognitive state anxiety or telic state component is the athlete's "negative affect" appraisal of arousal. The "positive affect" appraisal or paratelic state component is the athlete's positive affect appraisal (which hypothesized to exist

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in reversal theory, but, has not been operationalized through any valid assessment instrument). The telic state is further subdivided into interpersonal (Level 2.B-2.1) and intragroup state anxiety (Level 2.B-2.2) (according to Hanin's (1980) conceptualization). Finally, at the right side of the model the A-trait is depicted, which influences the athlete's cognitive interpretation of arousal ((Level 2.B).

The important point of this model is that it distinguishes between physiological and psychological arousal. As Gould and Krane (1992) have pointed out, although physiological arousal and cognitive appraisal of arousal components share common variance, they are in many ways unique. As these investigators noted, this model can help future research by clearly defining, in both theoretical and empirical/operational fashion, the arousal variables and by utilizing physiological and psychological measures of arousal.

### RELATIONSHIP BETWEEN ANGER, AGGRESSION WITH ANXIETY, STRESS

#### "BLENDING" OF EMOTIONS

Distinctions between anger and anxiety at the theoretical level have been made (Izard, 1977), but results from empirical studies demonstrated high intercorrelations (ranging from .67 to .88) between these emotional states (e.g. Zuckerman & Lubin, 1965; Pankratz, Glaudin & Goodmonson, 1972; Polivy, 1981). Most of these studies have been at the state level and the Multiple Affect Adjective Checklist (MAACL; Zuckerman & Lubin, 1965) was employed as a measure of anxiety, depression and hostility. Among the few recent studies on this issue are the ones conducted by Mook, van der Ploeg and Kleijn (1990). In particular, these researchers attempted to investigate the

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interrelationships of self-reported anxiety, anger and depression at the trait level in two studies. Among the various self-report measures the Spielberger Trait-Anxiety Inventory (STAI) and the Spielberger Trait-Anger Scale (STAS) were included, and nonclinical, subclinical, and clinical samples were employed. In both studies Mook et al. found that anger and anxiety were substantially correlated but as they noted these relationships were generally lower than those commonly reported at the affective state level.

Ben-Zur and Zeidner (1988) examined sex-group differences in anxiety, anger, and curiosity as states and traits among Israeli college students. The assessment instrument used in this study was the State Trait Personality Inventory (STPI) of Spielberger et al. (1979). Among other findings a strong correlation was found between state anxiety and state anger<sup>24</sup> and a moderate one between trait anxiety and trait anger<sup>25</sup> in both male as well female groups. On the basis of their results these researchers noted that anxiety and anger appeared less differentiated as states related to traits in both sex groups. They further compared their results with available data from American college students and concluded that, the anger and anxiety emotions may be highly similar, and thus often difficult to differentiate. As they

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<sup>24</sup>State anger is subjectively experienced as an emotional state which may vary in intensity and fluctuate over time as a function of the amount of frustration and annoyance that results from perceived injustice or the blocking of goal-directed behaviour in a given context. It consists of subjective feelings of tension, annoyance, irritation, fury, and rage, and is accompanied by physiological arousal (Spielberger, Westberry, Barker, Russell, Silva De Crane, & Ozer, 1980; cited by Ben-Zur and Zeidner, 1988).

<sup>25</sup>Trait anger is defined in terms of relatively stable individual differences in the disposition to perceive a wide range of stimuli as frustrating or annoying, and the tendency to respond to such situations with marked elevations in state anger (Spielberger, Westberry, Barker, Russell, Silva De Crane, & Ozer, 1980; cited by Ben-Zur & Zeidner, 1988).

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pointed out, this possibility was supported by the positive correlations between anger and anxiety obtained in their study as well as in the U.S. sample.

Hong and Withers (1982) attempted -among other goals- to clarify the relationship of trait-anxiety to trait-anger. First subjects of both sexes, who were students, identified as high and low in trait-anxiety and then their anxiety scores were compared with scores obtained in trait-anger and other variables. The results indicated that the high-anxiety group had significantly more trait-anger than did the low-anxiety group. Their conclusion was that, only those who have a predisposition to react with high anxiety to stress are also predisposed to anger.

Significant relationships were also found in the study of Joesting and Whitehead III (1976). Scores from two administrations of the State-Trait Anxiety Inventory (Spielberger et al., 1970) before and after a classroom examination were correlated with scores from the Profile of Mood States (McNair et al., 1971). With regard to the Anger-Hostility scale of POMS, this scale was correlated significantly only with trait anxiety in the first administration (before examination) whereas in the second one (after examination) was significantly correlated with both state and trait anxiety.

Indirect support comes also from studies which attempted to identify the relationship between cynical hostility<sup>26</sup> and stress (Houston & Kelly, 1989; Scherwitz et al., 1991). Results revealed that subjects high in cynical hostility reported more stressful experiences

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<sup>26</sup>Cynical hostility is a combination of anger proneness and a cynical, distrusting view of others (Smith et al., 1988).

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in their lives, and interestingly fewer coping resources. Finally, in a study conducted by Liakos (1978) the issue of the aggression-anxiety relationship was investigated. He reported mixed results, but since the sample in this study consisted of neurotic patients no further discussion on this study will be made.

Further evidence is provided by Van der Ploeg (1983) who studied test anxiety and anger in the field of examinations adopting the cognitive approach. According to Van der Ploeg (1983), although varying degrees of anxiety is usually the common reaction to examination stress, other emotional reaction may also be produced. First of all, the interpretation of an examination as a stressor gives rise to arousal. As he stressed, the key point is whether the person labels the arousal as anger or anxiety, and this depends on such factors as subject variation, situation variation, cognitive factors, learning history, and enviromental aspects. Then accordingly, state anxiety or state anger reactions will be observed.

Moreover, Van der Ploeg (1983) made an interesting point as he noted that, although there are situations which will be experienced as stress-arousing or anger-arousing irrespective of subjects variation, there are a number of situations in academic performance which usually result in *combinations* of anxiety, aggressive reaction tendencies, and certain other reactions. As such have been referred: frustration and blocking of goal directed behaviour, obtaining a poor mark or evaluation, being criticized, not being given appropriate recognition. After a brief review of the stress and aggression literature where the role of anger and irritation in stress responses on one hand and the role of general arousal in increasing aggression on the other is

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stressed, he concludes that evaluative situations can arouse anger, and thus test situations can be accompanied by anger which in turn can result in aggressive behaviour.

Furthermore, Van der Ploeg (1983) introduced the concept of test anger. The logic behind this concept is that, as examination stress and evaluative situations can arouse anger, which can lead to aggressive behaviour, test situations and the accompanying test anxiety can also be accompanied by anger.

In order to support the concept of test anger Van der Ploeg and his associates (1983) presented qualitative and quantitative data. With regard to empirical qualitative observations, these were made in a study with large groups of students. A group of subjects were asked to describe in writing an anger situation as well as what make them angry and why, while in another group subjects were asked to answer to the questions what make them anxious and why. The most important finding of the study was that some of the described situations (e.g. irritation, criticism, etc.) were given by students of both groups. Van der Ploeg (1983) reported then that these results are supportive of the notion that a certain stressor can lead to anxiety and also to anger. Therefore, anger plays a role in the field of test anxiety and can be experienced before (e.g. proper preparation), during (e.g. interfering with aspects of anxiety), or after examinations (results, recognition). As regards the quantitative data, the results indicated that scores of Test Anxiety Inventory (TAI) and State-Trait Anger Scale (STAS) were positively correlated, and that trait anger correlated more highly with test anxiety than did state anger. Further, Van der Ploeg noted that during examinations anxiety, anger and aggression form an integral

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part. In his view, if a subject fails to cope with the situation, anger can change to fear, or vice versa, and the (unsuccessful) use of coping resources can turn an anxious person into an angry subject. This is more or less in line with Spielberger's (1972a) observation regarding the characteristics of individuals with varying levels of anxiety. According to him, the anxious person typically: is aware of bodily functions in stressful situations, worries, feels tense, feels more sensitive than other people, is not calm, and *angers* easily.

Test situations as described in the study of Van der Ploeg (1983) seems to have similarities with the sport competitive situation. First of all, both are evaluative situations and the competitive element though in a different form is inherently involved. Also in both examination context and sport context certain situations (criticism, goal-blocking, poor evaluation, etc.) can lead to anxiety and anger. However, Van der Ploeg in his discussion of the study reported above clearly interpreted the results on the basis of undifferentiated arousal theory by noting that "... but before we can have a clear understanding of the relationship of (test) anxiety and anger, both forms of labelled arousal, ...." (p. 77). The question raised here is, if we do not accept this interpretation, how the results of Van der Ploeg's and other studies reported above and by extension the relationship between anger-aggression and anxiety could be explained? The "blending of emotion" position taken by Izard (1972) offers another alternative.

In Izard's (1972) words "emotions tend to occur in certain combinations or patterns. Discrete fundamental emotions undoubtedly occur in the life of an individual, but they probably exist separately for only a very short time before other emotions are activated. Moments of experience characterized by a single fundamental emotion are relatively rare in terms of the total time they occupy, and they are

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very difficult to obtain for sufficient duration and under conditions required for systematic study" (p. 3).

Different emotions maintain their own distinguishing features but they can operate in combination without losing their identity. For instance, anger, disgust, and contempt frequently form what is called by Izard (1991) "hostility triad".

Izard criticises the cognitive-theory oriented investigators (e.g. Epstein, Lazarus & Averill) who assume that once a particular emotion is elicited, this emotional state remains in pure form for a substantial period of time. In Izard's view this assumption is an untenable one because one emotion can almost instantaneously elicit another emotion which amplifies, attenuates, inhibits, or interacts with the original emotional experience. In the mean time, the person's cognition of the situation which has evoked the emotion is almost certain to elicit other emotions.

More specifically, he maintains that all complex emotional processes such as love, hate, depression and anxiety contain as elements two or more of the fundamental emotions or their components. In particular, he proposes that anxiety involves fear and two or more of the fundamental emotions of distress, shame (including shyness and guilt) anger, and the positive emotion of interest-excitement. He went on to indicate that, this formulation is implicitly or partially supported by almost all writers in the field; as revealed by a survey of theoretical and operational definitions of anxiety, all the above fundamental emotions have been included by more than one author. Sarason et al., (1960) analyzed the emotional sequence of test anxiety and Izard stressed that in the analysis of Sarason et al.'s the anxiety experience involves the fundamental emotions of fear, shame or guilt,



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distress and anger.

Izard (1972a) contends that a close look at the writings and experimentation of Spielberger (1966) and Levitt (1967) suggest that they too sometimes implicitly or explicitly include other emotions in their thinking and research on anxiety. To support his contention he wrote that Spielberger (1972) refers to anxiety as "complex emotional reactions." (p. 57).

Izard also maintains that all five components of a system are necessary for an adequate theory of anxiety, even though all experiences that are described as anxiety may not include all the possible component fundamental emotions. The way the emotion components interact may also vary from individual to individual within the same or different culture. According to him (Izard, 1971), socio-cultural phenomena constitute another factor influencing emotional processes that should be taken into account. *Cultural* differences in attitudes toward certain emotions are incorporated during socialization and result in different relationships between the emotions and between the antecedents, concomitants, and consequences of a given emotion.

Izard (1971) also proposes that each of the fundamental emotions has distinct components which are largely *interdependent*, but they also have a *degree of independence*, especially under certain conditions. He further noted that, an interaction mechanism is necessary for the integration of the components in the process that produces a complete and discrete emotion. Izard goes on describing this neuropsychological model considering at the same time acculturation processes. It was though that it will be better to present this description in his own words: "Concomitantly, the integration of emotion components into a particular individual emotion is a fundamental part of the process

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whereby the discrete emotions are differentiated. Without such integration of components we can have incomplete or undifferentiated emotions.

Components of two or more emotions may make simultaneous or rapidly alternating demands on neurophysiological mechanisms and on consciousness. Such a combination of the interacting and alternating components of different fundamental emotions could help account for the vagueness and undifferentiated character so frequently attributed to such nebulous and elusive concepts as anxiety and depression.

The proprioceptive patterns of these expressions determine or significantly influence the brain processes that generate the subjective experience of a discrete fundamental emotion. In American culture, as well as in many other cultures, socialization processes typically lead to a diminution or suppression of facial patterning as the individual moves toward later childhood and adolescence. ....The pattern of facial activity or the image of the corresponding pattern of proprioception is a chief determinant of the specific quality of any felt emotion. If the pattern is that of an innately programmed fundamental emotion there will be a corresponding specific emotional experience. A fundamental emotion will be felt. If the pattern combines elements of two or more innate programs or consists of two or more fundamental patterns in rapid sequence or alternation, the experience will consist of "mixed emotions." Such is the case with "state anxiety." It's a mix-up. It has no fixed neurophysiological structure. It has no characteristic face. .... Likewise, at the neurophysiological level elements of one emotion may interact in various ways with elements of another.

Izard has also noted that two or more fundamental emotions that are mixed frequently may produce over time a relatively stable emotional experience (a complex of emotions) that may be influenced by learning and experience. If there are certain prevailing conditions which regularly elicit this combination of emotions, this complex and its related cognitive-motor behaviours may take on the nature of a personality characteristic or trait, as is the "trait anxiety" a complex trait subserved by a relatively consistent pattern of emotions. However, both, the anxiety trait and the anxiety state, must be conceived as a variable combination of interacting fundamental emotions.

Izard (1972) in support of his position, presented results from several studies. In one study the Differential Emotion Scale (DES) was

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administered to black college students shortly after their campus had been invaded by armed national guardsmen and local police. During the occasion several students were injured and two others killed. Students were asked to recall the scene and describe their feelings. Results revealed significantly elevated means on fear, anger, sadness, shame, and interest.

In another study conducted by Bartlett and Izard (1972) students were divided into high and low anxiety groups on the basis of their scores on STAI. Subjects were required to complete the DES in two conditions, an imagined and a real condition (prior to a midterm examination). The profiles of the high anxiety students showed that the highest means are fear, interest, guilt, anger, sadness/shame.

Schwartz and Weinberger (1980) examined intercorrelations of emotions (among other anger, fear, anxiety) during various affective situations. Their study supported Izard's work (1972) demonstrating that emotions usually occur in complex patterns. They also found that although increases in the intensity of the emotions under study from moderate to high generally resulted in significant increases of scores in all negative emotions, there was no increase in anger during anxiety situations. However, more anger was reported in fear situations than in anxiety. Schwartz and Weinberger noted that since fear situations are inherently anxiety-provoking, fear may be refer to a specific type of anxiety, such as anxiety about physical harm.

Schwartz et al. (1976) supported Izard's position of "blending" of emotion with their findings which demonstrated that, the facial muscle activity of depressed subjects, while imagining a typical day appeared to be a mixture of the sadness and anger pattern.

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It is well-established that there are some relationships between autonomic nervous system and emotion. Thus another question that might be generated is how anger and anxiety could ever be experienced in the same situation and at the same time, since anger and fear or anxiety are conceptualized as (polar) opposites. It has been argued that the dominant system in anxiety or fear, for instance, is the sympathetic system and thus these emotional states are accompanied by such sympathetic effects as sweating of the palms, and dryness of the mouth, whereas in anger is mainly the parasympathetic system activated. Common sense will call Izard's position of blending of emotion into question. Izard (1972) however provided an adequate explanation.

According to him, experimental and observational evidence suggests that this is not the case for all fundamental emotions. This means that all emotions are not so closely identified with only one of the two systems. As he has pointed out, in certain fundamental emotions such as anger, both systems can be actively involved. The predominance of fear by the sympathetic system suggests that fear situation is of a greater emergency than the anger situation. The frightened organism under conditions of fear is prepared for flight or if there is not way to escape for a fight, but in the latter case the strength is not as great as in anger. On the other hand, in a context or combat where strength and endurance are required, a combination or alteration of anger with fear would take place, with the fear phase providing maximum strength and the anger phase providing endurance through the facilitation of required processes (Izard, 1972).

If we are to compare Izard's approach to the analysis presented by Van der Ploeg we could find similar points, though these were based

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on different theoretical formulations. However, the explanation given by Van der Ploeg regarding the formulation of anger-aggression, anxiety in an integral part is less informative than the one suggested by Izard.

Indirect support to Izard's position comes from Megargee's (1966) study who proposed that individuals who engage in assaultive behaviour can be divided into two distinct personality types: the undercontrolled and the overcontrolled. The individual of undercontrolled type may cope with a stressful situation by becoming verbally or physically aggressive within limits. The overcontrolled type of individual on the other hand is characterized by strong internal control, but when he cannot any longer cope with (a stressful situation), then he might react aggressively.

Megargee (1966) tested his hypothesis with groups of juveniles either with history of violent acts or with no violent offences and a group of moderately aggressive offenders. Results supported his proposition showing that the group of boys with the most violent history were less aggressive compared to other groups. Megargee's (1966) typology could be useful in understanding athletes' behaviour in sport context. In a competitive sport situation athletes experience stress and the competing demands add extra pressure on them. However they are restrained from aggressive acts because of the rules of the game. Thus, anger, which is itself a way of coping, cannot be expressed. If the stress of provocation overwhelms the prohibition against aggression, aggressive behaviour will be exhibited (Averill, 1982).

There is also evidence (Averill, 1982) which supports the notion

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that individuals after being subjected to psychological stress can possibly react in an aggressive or violent manner. In particular, when the individual's resources to cope with the threat are inadequate as in case of a lack of social (especially verbal) skills, then violent outburst may occur. This is not to say that athletes are lacking in verbal skills, but, they usually cannot express their feelings openly, because of the fear of punishment from the referees/umpires or to avoid arguments with the coach or teammates. This might add extra pressure on them that either is not expressed or can be sometimes expressed in an aggressive manner.

Thus far the studies that have been reviewed considered populations other than athletes. Next, a study conducted by Wall and Gruber (1985, 1986) will be described below since, to the author's knowledge, it is the only one in the context of competitive sport regarding the anxiety-aggression relationship.

Specifically, the purpose of Wall and Gruber's (1985, 1986) study was to determine if changes in aggression questionnaire scores covary with state anxiety scores associated with the importance and outcome of games. They utilized the Competitive State Anxiety Inventory (CSAI) to estimate arousal while for the assessment of aggression a short form of the Bredemeier Athletic Aggression Inventory (BAAGI) was used. Subjects of this study were female basketball athletes. The questionnaires administered to them before the contest and immediately following the contest in three selected crucial and easy games. The results revealed that aggression scores did not covary with scores of state anxiety. As these researchers stressed, this does not mean that arousal (state

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anxiety) and aggression are unrelated. They attributed the failure for a manifestation of this relationship to a variety of reasons such as : the BAAGI-S was not sensitive to these games conditions; women basketball players in the non-scholarship level may be not as aggressive as scholarship players; the administration of questionnaires was too far from the time when the arousal provoking events took place during the game. Another reason could be added. State anxiety in Wall and Gruber's (1985, 1986) study was treated as a unitary construct, but, as it has been noted in the relevant section, it is not. Martens et al. (1990) revised the CSAI, and the new instrument (CSAI-2) measures three components of state anxiety.

Another topic that should be considered before concluding this section is about thoughts. *Thoughts* may be important determinants of one's behaviour. This is particularly true in a sport context. Cratty (1984) has conducted some interviews and reported examples of thoughts of athletes from various aesthetic or non-contact sport. Some athletes admitted that they directed their anger against selected opponents and also that undesirable thoughts helped them to perform better in certain competitions. More characteristic was the case of endurance runners who reported that, to counter effectively the fatigue during races, they sometimes imagined themselves physically harming an opponent as they pass him/her. Thus, Beck's cognitive theory of emotion is of particular interest for the domain of sports.

According to Beck (1976) there is a conscious thought between an external event and a particular emotional response. When there is no external event to account for an emotion, it is usually possible to ascertain that there is an integral "cognitive event" that is, a

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thought, a reminiscence or image. Specifically, Beck proposed that anger follows from cognitive appraisal of unwarranted violation of one's rights or domain, anxiety results from the appraisal of danger in the absence of effective coping responses (Sterling & Edelman, 1988).

Several case studies have been employed to test this aspect of Beck's cognitive theory (e.g. Beck, 1972). More recently, Wickless and Kirsch (1988) using a sample of undergraduate students attempted to determine the degree to which thoughts of transgression, threat, and loss are associated with anger, anxiety and sadness respectively. Analyses of subjects' assessments of their own thoughts and feelings not only were highly supportive of Beck's hypotheses about the specific relations between feelings and thoughts, but also indicated that each type of thought tended to occur in combination with the others. Specifically, it was found that anger was associated with simultaneous reports of anxiety and sadness. To provide further support to their findings, Wickless and Kirsch (1988) cited results which were reported by Harrell, Chambless and Calhoun (1981). According to them, although specific negative self-statements were most highly correlated with corresponding negative emotional states, they were also related to other negative affects.

Building on Beck's one-to-one relation between thought content and emotional experience and the results obtained from their own study, Wickless and Kirsch (1988) assumed that "multiple thought contents ought to generate feeling states to which more than one category label might apply" (p. 377). Students in their study who reported anger were also likely to report anxiety or sadness in the same situation. Situations that evoked thoughts of anger also evoked thoughts of



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anxiety and sadness. These authors attributed their findings to the complexity of relationships between thoughts and feelings. Further research on this issue will be beneficial to the domain of sport and especially for non-contact sport, where the opportunities for overt aggression are not as many as in contact sport, and importantly, thoughts and feelings are related enough to warrant more attention.

Some more information which supports the notion of a relationship between aggression and anxiety directly or indirectly will be presented briefly:

- Toch as early as 1969 reviewed the case histories of several individuals who manifested high degrees of violent behaviour in their lives. He observed (Toch, 1969; p. 189) "persons who tend to interpret situations as threatening (as it is the case of high A-trait individuals), or goading, or challenging, or overpowering can turn harmless encounters into duels, purges, struggles for survival, or violent escapes". To explain from where these violent-prone ways of interpreting situations come Toch suggested that in certain segments of American society such "violence prone premises" or assumptions are widely held and accepted, and are therefore available for adoption as beliefs by individuals (Geen, 1990).

- Dengerink (1971) examined the relationship between self-reported anxiety and attack-instigated aggression. He identified high and low anxious persons and tested these two groups of subjects with the competitive reaction time task. The opponent gradually increased the intensity of shock for the subject from low to high across trials. The two anxiety groups did not differ significantly during the first block

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of testing in which the opponent chose mild shocks for the subject. As the opponent increased his attack during subsequent blocks, the low anxious group increased the intensity of their shocks for the opponent. The high anxious group, however, increased their shock choices for the opponent at an initially slower rate. Between the third and fourth block, the high anxious group increased the rate of their escalation and, during the fourth block, chose shocks for the opponent that were as intense as those chosen by the low anxious group. Dengerink (1971) reasoned that the lower shock settings of the high anxious subjects during the middle blocks may have occurred because the high anxious subjects were trying to avoid provoking the opponent into choosing the maximum shock. Once the opponent had chosen this intensity, they escalated their counterattack to the level chosen by the low anxious subjects.

Dorsky and Taylor (1972) replicated this study with college students, but employed different measure of anxiety and an additional measure of aggression. They reported that both high and low anxious groups consistently increased the intensity of shock for the escalated opponent. They also observed that the low anxiety subjects increased the duration of time that they pressed the shock buttons across blocks of trials, but the high anxious group decreased the amount of time that they pressed these buttons. Donnerstein et al. (1972) have suggested that the intensity of shock choices for a victim may be a direct measure of aggression and the duration of shock choices may represent a measure of indirect aggression. Therefore, as Dengerink (1976) concluded, the study of Dorsky and Taylor (1972) demonstrated a relationship between anxiety and indirect aggression while Dengerink

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(1971) demonstrated a relationship between anxiety and direct aggression.

- Bernstein et al. (1994) noted that when people are under stress they feel some strong emotion such as fear, anger. In fact, when people describe stress, they are likely to mention changes in how they feel, say for instance "I got upset and felt angry and frustrated" than "my heart rate increased and my blood pressure went up." Having a look at the responses of Greek athletes from open-ended questionnaires and interviews (Appendix 6) it can be seen that, in fact, this is the way some of them described how they feel in stressful situations. They report not a pure feeling-emotion, but a mixture of feelings. In most cases, emotional stress reactions subside soon after the stressors are gone. However, if stressors continue for a long time or come in a tight sequence, emotional stress reactions may persist. When people do not have a chance to recover their emotional equilibrium, they commonly report feeling tense, irritable, short-tempered, or anxious more and more of the time (Bernstein et al., 1994). This is in line with Izard's (1972) position of blending of emotions.

- Some theorists refer to aggression as a distal<sup>27</sup> antecedent of secondary anxiety which points up the complexity of anxiety relations. As an illustration, hostility and aggressive behaviour may be a

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<sup>27</sup>There are two types of consequences of anxiety: *proximal* consequences which are associated directly with anxiety and its concomitants, and *distal* consequences which might be described as consequences-of-consequences. Distal consequences are particularly important since they depend on the interaction of the consequences of anxiety with situational demands. For example, a direct consequence of anxiety might be poorer short-term memory functioning, and if short-term memory is important in performance on certain types of tasks, then poorer performance on such tasks would be classified as a distal consequence of anxiety. In some instances, such interaction leads to facilitation of performance, but in most instances the effects are debilitating (Spielberger, 1972: Vol. II, p. 417).

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nonanxious reaction to stress. But the reactions of others to this aggression, the aggressor's own guilt feelings, etc. then may become a source of what is referred to as "secondary anxiety." In this context, aggression is not a consequence of primary anxiety but is a distal antecedent of secondary anxiety (Spielberger, 1972b).

- Others (Biddle, 1995; Slepicka, 1995) refer to the feeling of anxiety as being a source of aggression. This, in combination with individual's aggressive tuning, a personal factor predisposing a person to aggressive behaviour, influence sensitivity to situational stimuli and with the experience of a situation that directly excites rage may result to aggression (Biddle, 1995).

- Anxiety can arise in several different situations. First, anxiety can be aroused by mild anger or hostility (since hostile behaviour has usually been punished in the past). Because hostile feelings evoke vague fears of punishment, anxiety is aroused. Second, anxiety may occur as a result of fear generalization in which fear learned in one situation arises in similar situations. Third, *anxiety may be produced as a result of frustration of motives*. Frustration produces anxiety in two ways. First, frustration tends to provoke aggression which leads to fear of punishment for the hostility. Secondly, frustration can cause fear of failure, either in achieving a desirable or positive goal or in avoiding an undesirable or negative goal (REA's Problem Solvers).

- Segall (1983) maintain that an individual may experience momentary states which can lead to aggressive behaviour. The first of these is awareness of conflict and the desire to resolve it in some way. Without conflict awareness and desire to resolve conflict, neither aggression nor a nonaggressive effort to resolve conflict would be

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expected from the organism. "Just how the conflict resolution attempt takes shape may depend on three other situationally provoked states, - anger, hostility, and anxiety- any one of which is likely to increase the short-term potential for aggressive behaviour" (p. 34). But any of these states may also lead to other behaviours, such as flight or attempts at negotiation and concession.

Overall, the studies reviewed above support a relationship between anger/aggression and anxiety. However, it should be kept in mind that the support for this relationship comes mainly from domains other than of sports. Therefore, in the sport context, is not easy to determine the extent of the relationships between these emotional states which have appeared in other fields. One ought to be cautious of certain limitations that can be identified.

Another limitation is that, in these studies, with the exception of Wall and Gruber's (1985, 1986) study, the samples examined and the measures employed were quite distinct than those used in the present study. Even when the sample used consisted of athletes, the competitive level and the extent to which these subjects were involved with sport was different from the level and involvement of athletes of the present study. However, since there are no studies directly on the issue under investigation, these other studies can serve to provide some idea in terms of whether a relationship is reasonably to be expected.

Finally, in the studies reviewed the relationship between anger and anxiety was mostly investigated. Anger often results in aggression, not always though. Anxiety on the other hand contains, according to Izard (1972), elements of other fundamental emotions such as anger.

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Therefore, bearing this in mind, together with the other evidence presented, it is reasonable to expect that a relationship between aggression and anxiety exists. It should not be forgotten, however, that in these studies aggression was treated as a unitary construct, while in the present study aggression is conceived as a multidimensional construct. Therefore, even when anger results in aggression, the angry aggression type is expected to be mostly related with anxiety, rather than the other types (honest, cynical). Although no inferences can be made with great certainty about honest and/or cynical aggression, it is a possibility that a honestly or a cynically aggressive athlete may turn into an angry participant.

This assumption is supported by the evidence cited in this section which suggests that aggression can occur in the absence of an emotional state (Bandura, 1973) and minimizes the role of arousal as a critical factor for aggression. McReynolds (1976) contended that an individual can be highly anxious without being highly aroused and that the opposite is also true. This position allows therefore room for a relationship between honest or cynical aggression with anxiety although these are not expected to be as strong as between angry aggression with competitive A-trait and competitive A-state.

To summarize, in view of the gaps in the literature, a major aim of the present study is to shed some light on the relationship between aggression and competitive anxiety in a cultural setting other than the one in which the reviewed studies were conducted, that is the Greek cultural setting. Another purpose of this investigation is to develop the Athletic Aggression Inventory (AAI), a valid and reliable measure

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of aggression which will be used with the standardized versions of the Sport Competition Anxiety Test (SCAT) and Competitive State Anxiety Inventory-2 (CSAI-2) to assess Greek athletes aggression and competitive anxiety levels as well as the relationship between these constructs. Due to the largely exploratory nature of this study, however, no specific hypotheses were formulated with regard to the relationships between a) aggression types and competitive A-trait, and b) aggression types and competitive A-state, and the null hypotheses will be adopted. However, following the reviewed theory and research findings presented earlier, it was generally predicted/expected that the angry type of aggression will be more strongly related to competitive A-trait and competitive A-state than the honest or cynical type of aggression.

There is a tendency for generalization of findings in sports across sports and gender and situation. In this study, the hypotheses tested separately for the whole sample, males and females and across sport categories.

Following the review of the literature, a summary of the hypotheses constructed in the first and second section along with the hypotheses of the third section will be presented below.

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### HYPOTHESES OF THE STUDY

#### Study I : ATHLETIC AGGRESSION

**Hypothesis 2.1.1 :** Bearing existing research findings in mind, it is hypothesized that a) contact sport athletes will exhibit higher levels of cynical and angry aggression than non-contact sport athletes; b) as regards individual and team sport athletes, no a priori conclusion can be formulated since it seems difficult to state whether the former or the latter will be higher in honest, cynical or angry aggression.

**Hypothesis 2.1.2 :** It is hypothesized that there will be significant gender differences in terms of the three aggression types and across sport categories. In particular, it is expected that females will hold higher levels of honest aggression than males but lower levels in cynical and angry aggression than males.

#### Study II : COMPETITIVE ANXIETY

**Hypothesis 2.2.1 :** It was hypothesized that a) contact sport athletes will exhibit higher levels of competitive A-trait and A-state (cognitive, somatic) and lower levels of self-confidence than non-contact sport athletes, and b) individual sport athletes will report higher competitive A-trait and A-state (cognitive, somatic) and lower state self-confidence than team sport athletes.

**Hypothesis 2.2.2 :** It is expected female athletes to be higher in competitive A-trait and A-state (cognitive, somatic) but lower in state self-confidence than male athletes.



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### Study III : ATHLETIC AGGRESSION AND COMPETITIVE ANXIETY RELATIONSHIPS

- 2.3.1. There will be no relationship between:
- a) A-trait and Honest aggression,
  - b) A-trait and Cynical aggression,
  - c) A-trait and Angry aggression, in total sample, males and females, and across sport categories.
- 2.3.2. There will be no relationship between:
- a) Honest aggression and Cognitive anxiety,
  - b) Honest aggression and Somatic anxiety,
  - c) Honest aggression and Self-confidence, in total sample, males and females, and across sport categories.
- 2.3.3. There will be no relationship between:
- a) Cynical aggression and Cognitive anxiety,
  - b) Cynical aggression and Somatic anxiety,
  - c) Cynical aggression and Self-confidence, in total sample, males and females, and across sport categories.
- 2.3.4. There will be no relationship between:
- a) Angry aggression and Cognitive anxiety,
  - b) Angry aggression and Somatic anxiety,
  - c) Angry aggression and Self-confidence, in total sample, males and females, and across sport categories.

Following, the study I (Athletic Aggression), study II (Competitive Anxiety) and study III (Athletic Aggression and Competitive Anxiety Relationships) that have been carried out will be described in chapters 3, 4, and 5 respectively.

## CHAPTER 3

### STUDY I ATHLETIC AGGRESSION

### Chapter 3: Study I Athletic Aggression

#### PHASE 1: THE MEASUREMENT OF AGGRESSIVENESS

In order to carry out with confidence the main research, preliminary work was undertaken to deal with particular difficulties and problems which could arise in the study (see Appendix 5). A great amount of this work was devoted to the development of a new questionnaire named the Athletic Aggression Inventoty (AAI).

One of the main concepts of this study is aggression. An extensive search in the aggression literature revealed that the instrument which met the criteria mentioned in Appendix 5 was the Bredemeier Athletic Aggression Inventory (BAAGI). The BAAGI was designed to assess the aggressive tendencies of athletes in terms of Instrumental and Reactive aggression. As Lefebvre et al. (1980) have suggested "the BAAGI is the only test of aggression which is specifically geared to athletics" (p. 24). However, since the BAAGI was designed to measure aggression of athletes from a different culture, it was the intention to test this instrument with Greek athletes first. Then, if necessary, to modify and/ or add a few new items in case the qualitative method revealed factors related to Greek athletes' aggressive behaviour. This was decided because, as Pepitone & Triandis (1987) have stressed, social psychologists must take culture into account for two reasons: 1) to determine if the stimuli that theoretically produce social behaviours have the same meaning everywhere, and 2) to determine if those given meanings have the same affect everywhere.

From the very early stage of the research numerous attempts were made by this researcher to obtain a complete copy of the BAAGI by

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contacting the test author or from other sources (e.g. scientific journals), but without success. Ostrow (1990) has cited some of the reasons which might make test authors reluctant to distribute a test. These are: The fear of misuse of the test; the concerns that other authors may dispute the preliminary evidence provided for the test; or, because they realize that, frequently, users borrow tests without providing the results of their follow - up data to the test author.

It is unknown whether any of the above or other reasons prevented the test author from sending a copy of the BAAGI. After that, and since the essential information about the use of BAAGI was not adequate enough upon which to base the research project, it was decided to adopt the opposite strategy. That is, to concentrate on the development of a new questionnaire by generating the main pool of items from Greek athletes' experiences and to borrow some items from the BAAGI.

In the next section the development of the AAI from the very early stage to the latest one will be described.

#### DEVELOPMENT OF THE ATHLETIC AGGRESSION INVENTORY (AAI)

The current research project was undertaken to develop a sport - specific measure of aggression. The instrument was designed specifically for athletes. Individuals differ in the way they perceive competitive situations and/or react within the sport environment under certain circumstances. Thus, the inventory has been developed to tap various aspects of aggressiveness and to be appropriate for males and females of both contact and non-contact sport.

The AAI (form A) had similarities to the BAAGI and was standardized using Greek athletes whose age ranged from 15 to 33 years

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old. The Greek subjects were chosen on pragmatic grounds, because the author had access to this population. Moreover, it was hoped that this piece of work would be an addition to the development of sport psychology in Greece.

As noted previously, culture shapes people's patterns of thinking and behaviour and is often associated with a particular country (Bernstein et al., 1994). Members of society, therefore, take their culture for granted and they are often unaware of its existence until they come in contact with people whose culture has shaped different patterns (Haralambos & Holborn, 1991). Having this in mind, and since the target population was not English speaking, the author felt that it was imperative to explore the ground before proceeding with the construction of the new questionnaire though it would have been much easier to borrow items from existing instruments, including BAAGI, and test them with the population of interest.

#### PLANNING THE INVENTORY

An exploratory project was undertaken at the very early stage of the construction of the AAI. In order to generate specific items the factors that elicited Greek athletes aggressive behaviour had to be discovered first. Both qualitative (interviews) and quantitative (open-ended questionnaires) method were employed.

#### INTERVIEWS

1. The main reason that a qualitative method such as interviews was chosen at this stage of research was that qualitative techniques generally intend to determine "what things exist and why" rather than

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how many there are. They usually yield large volumes of data from a limited number of individuals (Walker, 1988). With respect to interviews, as Burgess (1982) pointed out they provide,

"the opportunity for the researcher to probe deeply, to uncover new clues, to open up new dimensions of a problem and to secure vivid, accurate, inclusive accounts that are based on personal experience (Burgess, 1982, p. 107).

Aggressive behaviour in other cultures (e.g. American) have been examined by researchers and the questionnaires which have been developed have mirrored the aggressive behaviour of male and female athletes as they exist, for instance, in USA and other countries. However, the factors that may cause/elicit the aggressive behaviour of Greek athletes were unknown. Although it is expected that some of them will be the same for every culture's athletes, such a statement cannot be made without an investigation of the issue. Since for the Greek population the ground was unexplored, it was necessary to find out the factors responsible for their aggressive behaviour. Therefore, adopting this approach the researcher had the opportunity; a) to identify previously unknown or unhypothesized factors that influence Greek athletes' aggressive behaviour, and, b) to get a wide range of statements which could be used for the item construction of the questionnaire.

In recent years there has been an increase in the amount of qualitative research using in-depth interviews in sport psychology. However, there is no an explicit method to deal with the amount of semi-structured/ general interview guide data (Cote, Salmela, Baria & Russell, 1993).

Tesch (1990) reviewed the different kinds of qualitative analysis and distinguished between two main approaches, a) the interpretational

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qualitative analysis and b) the structural qualitative analysis. In *interpretational* analysis, elements, categories, patterns, and relations between properties emerge from the analysis of the data and are not predetermined. The main goal of the researcher employing this approach is to develop the best classification system that fits the data with minimal overlapping between categories. This section will focus primarily on presenting the steps followed for interpretational analysis which has been one of the most popular methods of qualitative analysis in sport psychology (e.g. Orlick & Partington, 1988; Scanlan et al., 1991). It should be noted, however, that the relevant literature makes it quite clear that there is no one correct way of analyzing qualitative data. Qualitative analysis remains a flexible process which can be adapted to the individuals under study and to various research problems (Cohn, 1990).

The interpretational analysis adopted involves two main operations which are: data organization or creating tags, and data interpretation or creating categories (Miles & Huberman, 1984; Patton, 1990). The first part of interpretational analysis, creating tags, separates relevant portions of data from their context which represent the information included in the interview transcripts. Using an open coding strategy the researcher looks for terms used by the individuals who are being studied and identifies meaningful pieces of information (Strauss, 1987; Tesch, 1990) which called "meaning units." In other words a meaning unit is a "segment of text that is comprehensible by itself and contains one idea, episode or piece of information" (Tesch, 1990; p. 116).

The second operation of interpretational analysis, creating

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categories, involves listing, comparing and regrouping text segments with similar meanings. To identify the categories a label that captures the substance/ essence of the topic is created. For example, the tag "I felt cold, something like hatred for my opponent" and "I try to give my opponent the message that I'm gonna win, trying in this way to panic/ scare him" are inserted with other similar tags into a category entitled "opponent."

A description of the procedures, decision criteria, and data manipulation is now presented.

**Sample Selection of Interviews** : The sample consisted of thirteen (13) athletes (Males = 9, Females = 4) from various sports. Their selection was based on the following criteria: First, they were current athletes of either contact (basketball, soccer, wrestling) or non-contact sports (volleyball, skiing, shooting, weight lifting, athletics). Second, all of them participated at the national level championships. This decision was based on the consideration that the experience athletes acquired from their participation at all competitive levels will be a significant contributor for the identification of factors of aggressive behaviour.

**Procedure** : Athletes were contacted through their coaches or by personal communication. The researcher informed athletes about the purpose and significance of the investigation, they were asked to voluntarily participate, and an interview date was established. The researcher met each respondent at a place and time that was convenient for the latter. It was assumed that the participants would feel more comfortable during the interview at their preferred meeting place and that no significant differences in responses would result from the



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various settings. Most of the athletes contacted agreed to participate. All interviews were conducted by this author, thus providing a constant across the interviews. The interviewer was a former athlete and P.E. teacher and hence familiar with the sport terminology and circumstances. In addition, the interviewer had a background in qualitative methodology and research. Moreover, previous experience with interview work allowed the interviewer to adopt a neutral stance, minimizing biasing responses (Patton, 1990). The interviews were semi-structured with a general interview guide to provide the necessary framework for the topic, and to facilitate the acquisition of qualitative data. The questions developed were based on the existing sport aggression literature and on the author's experience. The interviews were tape-recorded and their length fluctuated from forty (40) to eighty (80) minutes.

Introductory Part : In this part of the interview information regarding the nature of the investigation was given to the athlete and his/her permission to tape the interview was asked. It was emphasized that all data would be kept strictly confidential and that nobody would ever have access to information given by them. In this way it was hoped to obtain the most spontaneous possible answers. Other issues such as, uses of the data, reasons for taping the interview, were also discussed with the athletes.

The Interview Schedule : Before a discussion about aggression began, athletes were told that aggression refers to any behaviour, either physical or psychological, that is motivated by the intent to harm another person (Baron, 1977) and it can take many forms (e.g. verbal assault). They also encouraged to talk about their aggressive

intentions.

After a brief introduction they were asked to give information regarding a number of *factual questions* such as age, etc., and then questions based on the interview schedule were asked (Appendix 6). During the interview, athletes' responses were probed by employing probes such as "what else causes your aggression" or "can you tell me more about it." The concluding part of the interview was designed to make athletes feel more relaxed by shifting the focus from aggression to their future plans and ambitions with respect to their sport, so that ending with a more pleasant topic.

Analysis of Data : To prepare and analyze the qualitative data generated in this investigation a three-step procedure was utilized.

- 1) All interviews were transcribed verbatim, resulting in many pages of interview data.
- 2) The researcher read many times the transcripts to identify meaning units (quotes that captured the major ideas conveyed), characterizing each athlete's responses.
- 3) Categories were created by determining the common features which characterized the text segments and grouping quotes with similar meaning that represent the same factor of aggression across athletes. From the examination of quotes the categories which emerged were as follows:

Athlete him/herself; Opponents; Teammates; Coach; Referees; Spectators; Competition; Others.

Other factors that appeared to be a cause of athletes' aggressiveness were the special equipment athletes need for their sport (e.g. ski) and the (natural) environment (e.g. quality of snow,

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climatic conditions). But, since these factors were a cause of aggression for only some of the athletes, they were not taken into consideration in the construction of the AAI items.

It must be noted that to enhance the validity of the study, a guard against the coder's own perceptual biases must be provided, and, steps within each main operation such as the attribution of a tag for a piece of information and its inclusion to a category is better discussed between two or more researchers (coders) until they reach a final agreement upon the issue (Cote, Salmela, Baria & Russell, 1993). However, at that time, there was no research team to analyze the data and, in addition, to protect the confidentiality of the respondents, it was decided not to approach any other person to carry out this task. Nevertheless, this shortcoming was not crucial for the study, because the main goal was to obtain a wide range of statements which reflected aggression and types of aggression. However, to enhance the validity of the study and to minimize biases, items which were generated from this procedure were circulated to a panel of judges. In addition, for the final selection of items statistical analyses were employed as described in detail later.

A comparison of studies conducted by sport psychology researchers indicates that the presentation of their results differs (e.g. hierarchical diagram of categories (Scanlan et al, 1991); description of themes that best describe the data (Cohn, 1990; Orlick & Partington, 1988). The main goal however of each study, regardless of the presentation, is to reduce the amount of data and obtain a unified picture of the phenomena under study. As there is no one correct way of analyzing the data similarly there is no one correct way of presenting

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the data (Cote et al., 1993). In the present study, the categories which emerged from the second main operation of the analysis of data (creating categories) will be presented below with a few representative examples of paraphrased quotes from verbatim transcriptions which varied in length from a sentence to a paragraph. More examples of paraphrased quotes will be presented in the Appendix 6.

#### PARAPHRASED QUOTES OF VERBATIN TRANSCRIPTIONS

##### ATHLETE

I have my own way, a hidden/secret psychic force, all of us we have it, but only some of us can take advantage of it. I do, so, I can transcend/exceed myself. So, I perform at my highest level..... If you are a life-fighter, you are also a fighter in competition.

In order to gain some points, I make a very aggressive, wild play, even with the danger to make fouls ... I use all means in order to achieve my goal .....

When I'm defeated I keep thinking for hours, I criticise myself, I try to avoid being with my beloved ones, .... I am likely to start fighting/ arguing ..

##### TEAMMATES

When we warm up playing soccer, some teammates of mine hit my feet deliberately and I get very angered. I swear at them, I even may fall on them. You know, many guys have been injured in this way.

In a contest, when I make a mistake, a teammate or the coach says "what are you doing" and shout at me. At that moment I don't respond because I can understand his nervousness, and I overlook his bad behaviour.

When a teammate does not play well then I shout at him and generally speaking I am very offensive to him.

##### OPPONENTS

When I compete and I say to an opponent "track" and he remains in my way, then, when I pass him, I swear at him, to blow off steam and put away my stress.

Performing at my best level, achieving a spectacular basket shoot, making my game, playing smartly,.. is my way of retaliation. I am in the spirit of fair play and at the same time my exceptional performance is a kind of punishment for my opponent.

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#### COACH

I felt resentment for my coach when he didn't give me the pistol I asked for. I knew that I could improve my performance with the other one (pistol). He denied, and I wanted to give up... I still feel the bitterness and disappointment inside me, because there was n't ground for this denial.

My coach's remarks make me upset/irritated because, then, I can concentrate in the game and it makes me anxious.

I become, sometimes, upset with my coach because he does not pay the proper attention on me, and this may be a reason for not doing my best in competition.

#### REFEREES

When a referee supports the opposition, makes me angry.. I feel then a huge unfairness that push me to behave aggressively, for instance, to fall on my opponent and beat him black and blue.

When you are an experienced athlete you know who's fault is. If you know that you lost the victory just for one point and the referees are responsible for this, you are very upset with them, you go to locker-room and you kick, beat everything, swearing at the referees.

#### SPECTATORS

Ok, it is annoying to hear them (spectators) offend your mother, or to make negative comments about you all the time. It makes me angry and ... I may turn to them and say nasty things for them, as many athletes do,...

I try not to pay attention to them (spectators). Many times, when I play, I don't hear anything, I think only about volleyball..

I feel that my nerves are shaken when spectators disapprove me.

#### OTHERS

I get upset with the unfavourable comments of newspapers.

I get annoyed/ angry from the comments of other coaches and administrators,.. when they laugh at my performance. I get annoyed because not only they are ignorant but their comments are disreputable to me, and without good reason they give the wrong picture about me..

#### COMPETITION (itself or outcome)

Competition without aggression is with no meaning, like unsalted food.

Competition justifies the means. So, I use all means in order to win. Many wrestlers do it.

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Comparing the quotes included in the same category, it appeared that some of the quotes clearly reflected one or another type (instrumental, reactive) and form (e.g. verbal) of aggression.

Interpretational analysis was ended at this stage. The next step involved the item construction level. Reading the selected quotes of each category numerous times and having in mind the criteria for item selection as shown on the Item Construction (Form A) subsection, the AAI items were formulated in their first, unrefined form. Some quotes were retained as they were but some others had to be shorted to meet the criteria posed for item selection. To do so however, extra attention was paid to retain the meaning unchanged. As will be discussed later in this chapter, to achieve this purpose the assistance of a teacher of the Greek literature was sought.

#### OPEN-ENDED QUESTIONNAIRES

2. First some questions were constructed in the form of an open-ended questionnaire with regard to (psychological) factors that elicited athletes' aggressive behaviour in sports and daily life. In addition, a few biographical questions were included such as age, sex, etc. (Appendix 6). Then, the questionnaire was administered to current athletes who were involved in contact and non-contact sports for at least two years. Subjects of this project were athletes studying in the physical education departments, in the Aristotle University of Thessaloniki and Democritus University of Thrace (Greece). They were contacted prior to start of their classes, after obtaining the permission of the lecturers. Although the questionnaire was anonymous, athletes were given an envelope in which to seal the completed

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questionnaire before returning it either to the author or to their lecturer. It was assumed that this procedure would eliminate any concern the athletes might have for the lecturer knowing their responses. Responses from around ninety subjects were obtained but only about fifty of them were used for analyses because some of them (around forty) had been lost in the post from Greece to England.

Athletes' responses from the open-ended questionnaires were then analysed. The specific answers of interest were classified into categories. The first classification was made according to the order the questions which appeared in the questionnaire, namely, in training, before competition, during competition, after competition, in daily life. Then the responses, which appeared to fit in the categories which emerged out from the analysis of interviews, reclassified to those categories. Following, a few examples of athletes' responses from the first categorization are presented below:

#### PARAPHRASED OPEN-ENDED QUESTIONNAIRE RESPONSES

##### TRAINING

The fatigue and routine of training.  
My teammates' bad behaviour.  
High levels of tense in training.

##### PRIOR TO COMPETITION

Delay of the game (commerce).  
Glances and provocative words of opponents.  
The stress to perform well.

##### DURING COMPETITION

Foul play of opponents.  
Unjustifiable mistakes of myself.  
The effort to win.

##### AFTER COMPETITION

When others put the blame for team's bad outcome on me.  
Opponents' bad behaviour.  
Losing with little difference from my opponent.

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#### DAILY-LIFE

Serious personal or family problems.  
Others' doubts about my abilities make me lose my temper.  
When people try to take advantage of me.

Finally, potential items were formulated from the interview and open-ended questionnaire data and together with some items from the BAAGI constituted the main item pool. For the final selection of items statistical methods were employed as most appropriate to analyze and validate the instrument and will be described in detail in the following sections. This decision was based on the consideration that, since for various reasons (such as expenses, shortage of time) the analysis of data had to be done by one person only (the researcher), the danger of analysis bias is minimized. Another reason was that, the purpose of employing different approaches was to combine the gathered in order to formulate items.

Before proceeding with a description of the generation of items, it is worth mentioning the similarities<sup>1</sup> which appeared between responses given by Greek athletes and some of the BAAGI items (although they may appear in a positive or negative form). This similarity may suggest that some factors that elicit aggression are common for

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<sup>1</sup>Another comment here is also in order. Greek athletes' responses made it clear that they are not aggressive in their daily-social life, at least to the degree they are in sport situations. Their statements are in agreement with Hodgson's (1989, 1990) findings with the young athletes, who stated that they are not aggressive in non-sport situations. Also, several scholars offer some evidence that athletes tend to be less aggressive than most people in other areas of life (Nosanchuk, 1981; Zillmann et al., 1974b). This can be explained with reference to Bredemeier and Shields's (1983) findings that athletes use lower-stage reasoning in sports settings compared to reasoning utilized in real-life situations. It seems that athletes operationalize separate systems for making general and sports-related decisions (Wandzilak et al., 1988). However, recently Bredemeier (1994) found that those children who tended to describe themselves as more aggressive in sport also tended to describe themselves as more aggressive in other areas of life. Obviously, this issue should be exhaustively investigated in the future in order to reach some conclusions.



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athletes of both cultures. Some of the paraphrased AAI quotes-items and the corresponding BAAGI items are presented in Table 3.1.1.

**Table 3.1.1: Similarities Between the AAI and BAAGI Items**

| AAI (1st Pilot)   | BAAGI  |
|---|--|
| 1. For me winner is the one who remains calm and thinks with "clear brain" throughout the entire athletic event-competition.  | A winner is someone whose performance is completely detached from emotional responses to other people.   |
| 2. Is difficult for me to remain cool and calm in critical competitive events.<br>OR<br>Others characterize me as the athlete who keeps his cool even in the most critical moments. | I am usually cool and objective, even in the most stressfull situations.   |
| 3. I do not intend/plan to harm physically or psychologically my opponent.  | I have never felt any desire to harm my opponent.  |
| 4. Throughout the entire competitive period I get upset with the slightest thing/reason.  | { Throughout the entire athletic<br>{ season, I generally maintain a<br>{ constant emotional state.<br>{ OR<br>{ The competitive season does<br>{ not cause me to be more<br>{ grouchy than I normally am. |
| 5. I don't want to lose my self-control when other people watch me.   | I have never had a temper tantrum in a competitive situation.  |
| 6. Psychologically harming the opponent is an unwritten rule in my athletic meetings.   | At times I cannot control my urge to harm an opponent.   |
| 7. Every time I compete I try to wake up my wild instincts so that to become more aggressive.   | It is easier for me to "hate the enemy" once I get into the competitive situation.   |
| 8. Aggressiveness is the "salt and pepper" of competitive events.   | Arguments between two competitors help spice up sport activities.  |
| 9. Usually I become very nervous before competition although I appear calm outwardly.   | Even though I appear calm outwardly, inside I am a volcano of nervous energy.  |

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|--|--|
| 10. I can't leave without punishing anybody who threatens my physical well being.  | Whenever a teammate is injured by an opponent, I step up my efforts to make that opponent "pay" for what has happened. |
| 11. I have heard so many times the expression/words "go into the game and eliminate into nothing your opponent by all means" so, it has become my experience<br>OR<br>In my team, it is part of our game' strategy to use words in order to become more aggressive for the athletic contest. | Words like "attack" or "smear" or "kill" have never helped to prepare me for an athletic contest.                      |
| 12. Spectators' behaviour presses me so much psychologically that I lose my temper.  | In any athletic contest, crowd reaction never affects my performance.  |
| 13. It is folly for someone to react by swearing or kicking whatever is in his way when something is going wrong in the game.  | People who swear, throw equipment, or make a scene when something goes wrong during a contest, are childish.<br>OR     |
| 14. Sometimes I was filled with remorse for something I said or something I did to someone in a moment of anger.   | I have never had a guilty conscience because of my treatment of a sport opponent.                                      |
| 15. When fans jeer at me, I feel like going up the stands and square up with them.   | When fans heckle me, I usually respond by giving them a hard time, too.  |
| 16. Sometimes, when I get mad at my teammates, I say nasty words for them filled with gall.  | When I get mad at my teammates I sometimes say nasty things.   |
| 17. In athletic contests, the psychological harm of my opponent is not among my basic/main goals.  | It is fun to beat an opponent psychologically by teasing him/her.  |

These similarities warrant a brief comment. Despite the diversity of culture(s) (English speaking, Greek), it seems that there is a "hegemonizing tendency" as it has been called by Pearson (1979) that results in certain "meanings and ways" preferred by specific social groupings such as those we find in sports (team, clubs), and a dominant culture is created. This may not be suprising if we consider that Americans' major values orientation such as achievement and success

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have a great impact on Europeans' values. It may also hint at the finding regarding the position of Greece in the middle of the collectivism-individualism dimension. Hence, the definitions of culture, that, culture is "produced" as well as "acquired" and that it is "a constitutive social process, creating specific and different ways of life" (Williams (1977) may have application, at least, as far as the sub-cultures in the realm of sport are concerned.

#### ITEM CONSTRUCTION (FORM A)

The preliminary pool of AAI items was generated by composing items from data collected and analyzed with the above mentioned strategies, from author's personal experience of the Greek sporting scene and by reviewing the literature relating to questionnaire development (e.g. Kline, 1986; Oppenheim, 1986), and by selecting 32 items from the BAAGI (Bredemeier Athletic Aggression Inventory). The generation of the items was based on the following guidelines:

1. Items should facilitate the identification of Instrumental and Reactive aggression.
2. Items should be of a fairly general nature relevant to Contact and Non-contact sports.
3. They should be applicable to Individual and Team sports.
4. They should be equally relevant to male and female athletes.
5. Items should be relevant to Greek samples.
6. They should be short and unambiguous sentences.
7. They should be readily understood by athletes with low educational level.
8. (From the second pilot study (Form B) onwards) The completion of the AAI should not be very time-consuming.

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The original pool of 182 items was rated by a panel of four judges<sup>2</sup> for face or content validity, clarity of sentence structure and syntax. The same (above) guidelines were employed by them for item selection. Judges were asked to eliminate items which failed to meet selection criteria. Forty two (42) items were eliminated whereas some of the retained items were slightly modified to eliminate ambiguity. The remaining 140 items were distributed over the two scales (instrumental aggression = 56, reactive aggression = 84) and put into an inventory using the same format as the BAAGI questionnaire. Each item presented alternatives on a 4-point scale from "Strongly Agree" (SA) to "Strongly Disagree" (SD). Subjects were required to respond in terms of what they believed, and how they felt or would react in each instance, by placing in a circle the capital letters of their choice (e.g. the SA for Strongly Agree).

The inventory (form A) was administered to 310 subjects who represented contact and non-contact sports. Subjects ranged in age from 15 to 32 years. Most of them were athletes with rich competitive experience and were drawn from teams of the national level categories. But there were also some athletes who had just two years competitive experience. However, only the questionnaires of 304 male (N = 209) and female (N = 95) athletes were used for statistical analyses. The remaining six questionnaire were only half completed thus they were excluded from the analyses. A series of statistical analyses were

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<sup>2</sup>One of the judges was Professor (sport psychologist) in the Physical Education Department in the University of Athens; the second and third judges were sport psychologists (a lecturer and a research assistant) in the Physical Education Department in the Aristotle University of Thessaloniki, Greece, and the fourth one was a teacher of Greek literature.

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performed in order to analyze data obtained from the pilot study (form A). Whilst these analyses were in progress, the author was informed about another model of athletic types of aggression.

The new model was constructed by Hodgson and it was based on TOYA's (Training of Young Athletes) study findings. According to Hodgson (1990) 280 young athletes were interviewed with regard to their self-perception and ideas about aggression. Their answers were then analyzed and classified into a model which allowed important distinctions between the types of aggression (chapter 2, Figure 2.1). In spite of its weaknesses, as discussed in the review of the literature chapter, the new model seemed to offer a better understanding of athletes aggressiveness by distinguishing types of aggression. A first attempt was made to roughly classify the AAI items into the nine sub-scales of the model :

- Honest : a) Mental, b) Verbal, c) Physical
- Cynical : a) Mental, b) Verbal, c) Physical
- Angry : a) Mental, b) Verbal, c) Physical

In fact, at the end of this procedure there were items in each sub-scale representing a particular type of aggression. Then, the next step was to follow the standard procedure for item selection. The results of this attempt were impressive but not satisfactory enough since the alpha reliability coefficient of the Honest Mental aggression subscale was .52 and therefore not acceptable whereas the Honest Physical subscale was not very distinct. Having these encouraging results it seemed reasonable to expect that by modifying some items on the one hand, and composing some other for the Honest Physical Aggression scale on the other, it would be possible to have items which

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could completely represent the nine aggression types of the model. To attain this purpose it was decided to carry out a second pilot study. For this reason the results of the AAI from the first pilot study (form A) are not presented.

In the following section the procedures that took place throughout the second pilot study will be described in detail since they formed the basis for the main study.

#### ITEM SELECTION (FORM B)

Once the adoption of the new model had been decided, the next step involved the modification of some of the existing items and the composition of a few new items for the measurement of the model's constructs. A new round was initiated. The procedure that was followed was structural analysis which assumes that the structure is contained in the data and the researcher's job is to uncover it (Cohn, 1991; Tesch, 1990). Such an analysis utilizes the data obtained with the methods described earlier and organizes it into predetermined categories as proposed by Hodgson. The item pool consisted of 135 items which were circulated to four judges. Two of the judges came from the physical education domain (Physical Education Department of Manchester, England, and Thessaloniki, Greece, respectively) and they were familiar with the aggression theory in sports. The third was a professional track and field and basketball coach, and the fourth one was a qualified teacher of Greek literature. In order to assess items in terms of clarity, syntax, language and idioms athletes use in competitive and none competitive situations, a discussion was held with each of them separately and according to their specialization. The same

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criteria were employed once again with only one difference. This time items were assignable to nine scales representing a particular type of athletic aggression. The 126 items retained from the original pool were distributed over the nine sub-scales as follows:

1. Honest : Mental: 14 items; Verbal: 17 items; Physical: 17 items.
2. Cynical : Mental: 10 items; Verbal: 13 items; Physical: 13 items.
3. Angry : Mental: 18 items; Verbal: 13 items; Physical: 11 items.

Items are rated again on a 4-point scale and they became known as Form B of the AAI. It should be noted that 13 items were borrowed from the BAAGI (Appendix 6) and included in the item pool of the 2nd pilot study. Their selection was based either on the similarity some of the BAAGI items with the AAI items, or because they seemed be applicable to athletes of all sport categories.

#### PILOT STUDY : Procedure and Sample Selection

One of the purposes of this study was to investigate aggression levels a) of athletes from teams which were ranked among the ones in the first and second national category, and b) with respect to individual sports, of athletes who participated in events of a high competitive level organized by the Federation of their sport every year. In order to participate in the study, the athletes were required to have played at least one (1) year of competitive experience. Thus, a special attempt was made so that respondents in the pilot study were as similar as possible to those in the main inquiry (Oppenheim, 1986).

First of all, the permission of the coaches of teams and athletic clubs was received for access to their athletes. The sample for testing the AAI items consisted of 178 athletes from contact and non-contact sports. The questionnaire was administered to them at the end of their

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daily training. Instructions for the completion of the questionnaire was given to them and they were assured that their responses will be kept confidential. In order to reduce the possibility of biased responses the following precautions were taken:

- The questionnaire was under the general title "Questionnaire for Athletes." Subjects were told that the questionnaire measures athletes' emotional state under practice and competitive conditions.
- Subjects were asked to read the Anti-Social Desirability instructions before the completion of the questionnaire. Recently research with Martens et al. (1990) for testing the CSAI-2 revealed that anti-social desirability instructions are very beneficial in reducing response bias. These instructions were modified for the AAI and they were employed in both the pilot study and main research (Appendix 9).
- To further minimize response distortion problems an additional assurance was given to athletes in the form of a sworn statement which has been executed by a lawyer. Through this statement the researcher stated that subjects' responses will be solely used for scientific purposes and nobody would ever have access to responses given by them. This statement gave them also the legal right to take action against the researcher in case the conditions of this statement were violated. A copy of the statement with the name, address and telephone number of the lawyer was attached with each questionnaire. Subjects were encouraged to detach and keep this copy (Appendix 9). Via this statement it was "sought to create an atmosphere that conveyed to subjects the importance of honest responses and the significance of subjects' contribution to .. research" (Martens, 1977; p.iv.).



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- The correlation of an item with the Marlowe-Crowne Social Desirability scale (M-C SD) (Crowne & Marlowe, 1960, 1964) (Appendix 7) had to be non-significant.

On completion, athletes were asked to provide feedback as to any difficulties they had encountered, any unclear or ambiguous items, in the last page provided for this purpose, so that, adjustments to be made before the presentation of AAI to a larger sample. No-one reported any unclear or ambiguous items. The suggestions they offered were positive comments about the questionnaire as well as for future research rather than for modification of items. However, from the total number of 178 questionnaires collected only 134 (males  $N = 97$ ; females  $N = 37$ ) were used for the statistical analyses for the final version of the AAI. The remaining 44 questionnaires were not included in the statistical analyses because the athletes who completed these questionnaires had a high score on the Social Desirability (M-C SD) scale.

Subjects scores on M-C SD scale was another criterion used in this investigation regarding item as well as subject selection. Williams and Krane (1989) have stressed that one potential inherent in all self-report tools is the possibility of response bias. It is true that in sport psychology research and practice, relatively little attention has been given to the possibility that athletes may distort their responses on self-report measures. Morgan (1980a) was one of the first sport psychologist who suggested that "it is quite conceivable that groups of subjects differing in physical ability may not differ on selected psychological traits simply because of response distortion" (p. 334). Morgan further noted that "it is widely recognized that most

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self-report inventories are easily faked" (p. 335). According to Hokanson (1961), questionnaires which measure aggressiveness are vulnerable to the subjects' conscious control over their responses in a socially desirable direction. Nickel (1976: cited by Hackfort & Schwenkmezger, 1989) has pointed out that the problem of social desirability responding is particularly acute in younger subjects. On the other hand, the AAI is a new psychological inventory which attempts to measure behaviour which may be regarded as "negative" (aggression) and that make a sensitive issue for most of the people. People avoid acknowledging their own aggressiveness in particular in certain circumstances because they believe that such a behaviour is not only unacceptable but reprehensible as well. In fact, individuals who are dependent to some degree in the positive evaluation of others are expected to have -even- greater problems in the recognition of aggressiveness. This is a means of protecting a defensive picture of themselves, since they perceive that the admission of aggressiveness entails the threat of social rejection. This view is supported by Conn's early findings (cited by Crowne & Marlowe, 1964) which provide striking evidence that the influential behaviour of approval-dependent individuals is associated with defence against hostility. Also, a number of writers (Barthel & Crowne, 1962: in Crowne & Marlowe, 1964) have commented on the social forces operative in the testing situation. Certainly, an individual is likely to be concerned about the consequences of his behaviour. "When an individual is commanded by an organization to reveal his inner-most feelings, he has a duty to himself to give answers that serve his self-interest rather than of the Organization. In a word, he should cheat... Most people instinctively

cheat anyway on such tests" (Crowne & Marlowe 1964; p. 11).

The aforementioned is common sense to researchers who work in different fields. Various strategies have been employed by some of them in order to show that their measures are relatively unaffected by biased responses. Among these techniques a widely known means to reduce or even to eliminate social desirability bias is the Marlowe-Crowne Social Desirability Scale (M-C SD). However, the M-C SD scale has not been used often by researchers for the construction of psychological measures as far as aggression inventories are concerned. The M-C SD scale had been employed by Bredemeier (1977) as another criterion for supporting the construct validity of the BAAGI. According to her, construct validity was assessed by comparing an intercorrelation matrix subjects' scores on the BAAGI and Marlowe-Crowne SD scale. "Small but significant correlations indicated that social desirability response was more closely associated with instrumental than with reactive aggression" (p. 137). However at the same time, this is also evidence of social desirability contamination of the BAAGI (Ostrow, 1990).

Taking into account that psychological measures are vulnerable to social desirability bias on the one hand, and Morgan's (1980b) suggestion that significant contributions to the research literature can be made by recognizing and correcting methodological problems as in the case of the problem of response distortion and the importance of having a measure only to a minimum degree (affected) by such responses, the M-C SD scale was used to ensure more reliable results. The M-C SD scale is reported as reliable and valid instrument (Crowne & Marlowe, 1964). Information about the development of the M-C SD scale and its psychometric properties are shown in Appendix 7. Following, the pilot

study of this instrument with the Greek athletes is presented.

Pilot Study of the Marlowe-Crowne Social Desirability Scale: In order to administer the M-C SD inventory to a population different than the one for which it was developed, a necessary procedure had to be undertaken. This procedure involved the testing of the instrument with the population under study, since a translated version of the scale was intended to be used (Oppenheim, 1986). Therefore, first of all the translation of the M-C SD scale into the Greek language had to be done.

Initially the author translated the M-C SD scale. Then, both the original measure and the translated version were given to two colleagues of the author, who had done postgraduate studies abroad and speak English fluently. They were asked to make their comments on the translated version independently. There was a slight difference in translation for three items. These items were further examined by the translators and a slight rewording on the author's translation was decided. This version complete with the instructions for subjects was given to a teacher of Greek language for syntax corrections. The resulting version was then administered to almost all subjects at the same time with the AAI (Form A and Form B) and completed after the AAI and SCAT completion.

**MARLOWE-CROWNE SOCIAL DESIRABILITY SCALE (M-C SD) AND THE  
ATHLETIC AGGRESSION INVENTORY (AAI)**

The statistical analyses for the study performed through the Statistical Package for Social Sciences (SPSS Inc., 1986, 1990). The reliability coefficient for M-C SD scale which computed through Cronbach's alpha coefficient, was .72 for Form A (subjects N = 272)

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whereas for Form B was .75 (subjects  $N = 178$ ). Since the reliability of the scale was acceptable, though lower than the one reported by the researchers, Pearson's product moment correlations were computed for examining the relationship of AAI items with the M-C SD scale. The correlations computed for the total sample ( $N = 178$ ) and separately for Males, Females, Contact and Non-contact sport categories.

Examination of the correlations showed that 11 items were significantly correlated with the M-C SD scale across the four categories, thus they were eliminated from further analyses. However, there were some other items which had a significant correlation coefficient with the M-C SD scale but only for one or two from the aforementioned categories (e.g. Males and/or Contact). Taking into account the documented view of Crowne and Marlowe (1964) that "the degree to which social desirability is amenable to control is relative since there is ample evidence that the circumstances surrounding the administration of psychological measures can themselves evoke socially desirable responses" (p. 199), it was decided to exclude from further analyses of the AAI the responses given by subjects with high score on the M-C SD scale. The rationale that led to this decision was that since it was impossible to control or change the circumstances causing the biased responses for the time being, what could be done was to exclude those subjects who had affected by these circumstances and therefore to minimize the social desirability contamination of the AAI.

#### PILOT STUDY : The Athletic Aggression Inventory (AAI) (Form B)

To select the most appropriate items for retention in the final sub-scales a relatively standard procedure for test construction was

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carried out which involved: item analyses (item to subscale correlation) and factor analyses. Items were included in the hypothesized subscales if they met the following evaluation criteria.

1. The correlation coefficient of an item to sub-scale correlation had to be acceptably high, that is, at least .50 for the total sample and .40 for males, females, contact and non-contact sport categories.
2. Items should not have a higher correlation coefficient with another subscale.
3. Items should have at least a .40 factor loading.

At the first stage item analyses were carried out. Five item to item matrices were generated for the total number of items: one matrix for all subjects together ( $N = 134$ ), one for males ( $N = 97$ ), one for females ( $N = 37$ ), one for contact sport ( $N = 88$ ), and one matrix for non-contact sport ( $N = 46$ ). Then, the item to subscale scores were calculated for the total sample as well as for the four categories (males, females, contact and non-contact sport) separately. Many items easily met the criterion of .50 correlation coefficient on their own subscale with regard to total sample, but it was much more difficult for the individual items to meet this criterion across the four categories. Many times items had a high correlation coefficient in three categories (e.g. for males, females and contact sport) but failed to reach the criterion in the fourth one (e.g. non-contact). Thus, a great number of items were eliminated throughout this procedure.

Factor analytic techniques were used in conjunction with the item to subscale correlations to select items and verify hypothesized factors. Initially, principal components analysis was used which is a relatively straightforward method of transforming a given set of

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variables into a new set of composite variables (principal components) that are uncorrelated to each other (orthogonal) (Magnusson, 1967; Nie, Hull, Jenkins, Steinbrenner & Bent, 1975). The original pool of items was progressively reduced over all the stages from 126 to 46.

However, the number of remaining items was not adequate enough for the generation of nine (9) factors required for the full model with sufficient number of items on each factor. Thus, it was decided neither to insist on the full model nor to change the criteria of item selection but to attempt to verify the main constructs of the model namely Honest, Cynical and Angry aggression.

The same procedure was employed once again, except that now item to subscale correlations and factor analyses were performed to determine the three factor structure of the AAI. Finally, from the original pool, 33 items remained representing the refined three subscales (Appendix 9). Results for item to subscale correlations with regard to the total sample, males, females, contact and non-contact sport categories are presented in the Appendix 8.

The results (Table A.8.1) showed that all items but one from the angry aggression scale met the criterion of .50 correlation coefficient. Since the correlation coefficients of this item on the other categories (Table A.8.4) appeared to be in accord with the criteria, and because it was deemed that it was important for the scale, it was decided to retain the item for further analyses. The internal consistency of Honest (10 items), Cynical (13 items) and Angry aggression (10 items) subscale was examined by the Gronbach's alpha reliability coefficient. The results showed that the Cronbach's alpha reliabilities are adequate (ranging from .76 to .86 for the total

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sample). Reliabilities for all categories are presented in Appendix 8 (Table A.8.5 and Table A.8.6).

Further, a principal components factor analysis was performed. The purpose of doing so was twofold: to assess the construct validity of the AAI and to examine the discriminant power of the individual items of the three subscales. Eigenvalue cut offs of 1.00 or more were employed for factor extraction. Then, the obtained simple factor structure was rotated using both varimax and oblique rotation. As has been mentioned above, the criterion used for this analysis was a factor loading of .40 or more on only one factor. The rotated item loadings are shown in Appendix 8, Table A.8.7. As can be seen by the table, all items met the criterion of .40 factor loading. In general, a distinct factor emerges for each of the three types of aggression (accounting for the 36.3 % of the variance) supporting both the construct validity of the Athletic Aggression Inventory and the discriminant power of the AAI items.

#### INTERCORRELATION BETWEEN THE SUBSCALES OF THE ATHLETIC AGGRESSION INVENTORY (AAI)

For the total sample, the inter-scale correlations between HAG with CAG ( $r = .15$ ) and HAG with AAG ( $r = .02$ ) are low. However, the intercorrelation of CAG and AAG ( $r = .35$ ) showed a significant relationship between the two scales. This fact indicates that these two types of aggression are not completely independent of each other. Cynical and angry aggression appear to be separate but related factors. As regards the inter-scale correlations of the other categories they showed a similar pattern across categories. The size of inter-correlations in these matrices is again quite low except from those



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between CAG and AAG. The inter-correlations between the subscales of the AAI for all categories are presented in Appendix 8 (Table A.8.8 to Table A.8.10).

#### ATHLETIC AGGRESSION INVENTORY VALIDATION

To determine the validity of a test, various specific methods are employed. These are grouped under three principal categories, namely, content-related, criterion-related, and construct-related procedures for accumulating evidence of validity (Anastasi, 1990; Magnusson, 1967; Standards for Educational and Psychological Testing, 1985). In order to provide adequate evidence for the validity of the AAI each of these categories will be considered separately below.

Content-related validation involves the systematic examination of the instrument content in order to determine whether it covers a representative sample of the behaviour to be measured (Anastasi, 1990). Content-related evidence of validity of the measure was a central concern during the development of the AAI. The methods which have been used for gathering the information (items construction -so that they were representative of the sport domain- and experts' professional judgments as they had been described earlier in this chapter) have established evidence of content validity of the AAI. *Face*<sup>3</sup> validity on the other hand has been supported by the fact that subjects commented positively on the suitability of the instrument for their sport and found little or no difficulty in completing it.

Criterion-related evidence demonstrates that scores obtained by

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<sup>3</sup>Face validity is not validity in the technical sense. It refers to what the test appears superficially to measure and not what the test actually measures (Anastasi, 1990).

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an instrument are systematically related to one or more outcome criteria. Criterion is a direct and independent measure which the test is designed to measure and/or predict. The criterion measures are distinguished in *concurrent* and *predictive* ones (Standards for Educational and Psychological Testing, 1985). The distinction between them is based on the objectives of testing. Concurrent validity is relevant to measures employed for *diagnosis* of existing status, rather than prediction of future outcomes, thus is usually preferable for psychological tests (Anastasi, 1990). The difference can be illustrated by asking : "Is x athlete aggressive?" (concurrent validity) and "Is x athlete likely to become aggressive?" (predictive validity).

Evidence for the *concurrent* validity of the AAI subscales has been obtained from athletes who were asked to complete a small questionnaire which was developed for that particular purpose. This questionnaire has its origins in the Profile Mood States (POMS) inventory (McNair, Lorr & Droppleman, 1971). The POMS measures six identifiable moods or affective states. One of them is the Anger-Hostility factor which is defined by 12 adjectives and represents a mood of anger and antipathy towards others. The scale has proved to be a sensitive descriptive measure for assessing the effects of various experimental manipulations upon normal subjects and other non-psychiatric population.

The questionnaire used in this study consisted of 15 phrases. Five of them were identical to the ones included in Anger-Hostility scale of POMS, whereas some others were generated by listing the antonyms and synonyms of adjectives of the Anger-Hostility scale of POMS (The Penguin Dictionary of English Synonyms, 1991). Then, from the

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long list of phrases, those which seemed to convey better the meaning of the main concepts were chosen to represent Honest (5 items), (e.g. Fighting), Cynical (5 items) (e.g. Provocative) and Angry (5 items) aggression (e.g. Annoyed-Bothered). Each phrase was rated on a 5-point intensity scale ranging from "Not at all," "Little," "Moderately," "Quite a Bit" to "Extremely." The questionnaire was administered at the same time with the AAI (Form B). Subjects were instructed to respond by circling the appropriate letter(s) which described how they have been feeling during the past week including the day they completed the questionnaire. The purpose of the one week rating period in the instructions was to emphasize a period sufficiently long to depict the athlete's persistent mood reactions to his/her current athletic/sport situation (McNair et al., 1971). The Pearson's product moment correlations were employed between the AAI scales and the sets of adjectives-phrases which corresponded to them. It was expected that subjects scores on the short questionnaire of Mood State will be significantly correlated with their responses on the AAI. According to the results, the validity coefficients appear to be low to moderate, ranging from .17 to .42 (Appendix 8, Table A.8.11). However, since the validity coefficients are high enough to be statistically significant at some acceptable level, such as the .01 or .05 level of significance, they provide clear evidence (Anastasi, 1990) regarding the concurrent validity of subscales.

Another criterion measure against which AAI scores were validated was coaches subjective evaluation about athletes' aggressive behaviour. Coaches judgement was also employed in some other studies as a criterion for the validation of an instrument (e.g. Bredemeier, 1977).

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It was reasonable to assume that the coach is the person who is most likely to know the reactions, way of thinking and his/ her athletes' behaviour under certain circumstances in general. But, since there is always the danger of biased responding because coaches' opinion might favour some athletes, the importance of their objective responses was stressed and their honest cooperation was asked. In addition, the same legal assurance given to athletes (Appendix 9) about strictly confidential responding was also provided to coaches. However, not all coaches were appropriate for this evaluation. As Landy & Farr (1980) have suggested, for the ratings to be accurate, raters must have knowledge of both the individual being rated and the task. The fact that they were working as principal coaches with the teams and athletic clubs at that time in conjunction with their career history as experts in their field, ensured their relevancy to the task. It was also of extreme importance for the study that coaches had worked athletes at least for one year. Although working experience of more than one year was considered as more appropriate, it proved to be almost impossible to put such a criterion since few coaches remain/work with the same team or athletic club for many years.

The purpose of the research was explained to coaches and then a 12-statement questionnaire administered to them asking to evaluate their athletes' behaviour during training sessions and competitive situations. An example of such a question for honest aggression is: In Your Opinion, this (x) athlete "adjusts when the unexpected happens in a daily training or in a contest and struggles in order to perform at his/her highest level." Their responses were rated on a 5-point intensive scale. Intensity modifiers were "Always", "Often",

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"Sometimes", "Rarely" and "Never." Fourteen coaches participated in the research and one hundred forty questionnaires were collected by them but only 110 were used for the statistical analyses. The remaining 30 questionnaires were not included in the analyses since these assessed the behaviour of those athletes who had been excluded from the study because of their high score on the M-C SD scale. When the AAI responses and coaches' evaluation correlated another form of concurrent validity was reflected.

The results of correlations between athletes' scores on the AAI and coaches evaluation are presented in Appendix 8 (Table A.8.12). Significantly positive relationships are reflected, ranging from .23 to .35, further supporting the validity of the AAI. It is important to note here that, though not surprising, higher correlations were expected between coaches' ratings and athletes' scores. As Martens (1977) noted, "coaches are generally quite confident in their ability to evaluate players attributes, particularly an important factor such as A-trait" (p. 76). However, as research in the field of competitive anxiety (Martens, 1977; Martens et al., 1980) indicated, overall, coaches were not as accurate predictors of athletes' competitive A-trait and A-state as they were expected to be and their predictions were significantly influenced by the sex of participants, and size of team. Also, results suggest that, older coaches with more experience have been found to be more accurate in predicting competitive anxiety. Taking therefore into account that, most of the coaches participated in this study were not only young adults but also that they were with teams and athletic clubs for a small amount of time, these results are considered as satisfactory.

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**Construct-related** validity of a test is the extent to which it measures the psychological characteristics of interest (theoretical construct). The construct of interest should be embedded in a conceptual framework which specifies the meaning of the construct and distinguishes it from other constructs. One of the techniques most often used by the researchers and is particularly relevant to construct validation is factor analysis (Cronbach & Meehl, 1955). As it has been noted, a major purpose of factor analysis is to simplify the description of behaviour by reducing an initial set of variables into a few interpretable factors. Such evidence has been already provided in Appendix 8 (Table A.8.7). Furthermore, both content- and criterion-related validation, which have been described above, contribute to construct-related evidence (Anastasi, 1990; Standards for Educational and Psychological Testing, 1985).

In summary, the above described procedures resulted in the final form of the new 33-item questionnaire. The Athletic Aggression Inventory (AAI) consisted of three scales, Honest (HAG), Cynical (CAG) and Angry scale (AAG). The obtained results regarding the AAI's reliability and validity so far appeared to be quite satisfactory encouraging the use of this instrument in the main study.

#### PHASE 2: MAIN RESEARCH

The data obtained from the main study was analyzed for further examination of the psychometric properties of the AAI (as well as of SCAT and CSAI-2 instruments). In this section the sample, the procedure and the analyses performed for this purpose will be described in detail.

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### SAMPLE AND PROCEDURE

Data for testing the hypotheses of this study were gathered from both male and female athletes across the following sport categories :

1. Team Contact sport
2. Individual Contact sport<sup>4</sup>
3. Team Non-Contact sport
4. Individual Non-Contact sport

Team (contact and non-contact sport) athletes were members of teams which participated in the A and B Greek national categories. These categories consisted of the most skilful teams in the country. Often there is not much difference in the ability of members of the A and B national categories. This is confirmed by the fact that the national teams are comprised of athletes drawn mainly from the above categories. The sample of individual contact and non-contact sports consisted of athletes who had competitive experience of Pan-Hellenic competitive events which are the highlight of the year's events in their sport. In these events athletes strive to reach the peak of their performance, to break their own personal record and/or records held by other athletes and to establish new ones. Also, the successful participation in these events qualifies them as prospective members of the national teams in their sport as representatives of the country in international athletic events. Thus, for both individual and team sport athletes participation in the national team of their sport is a "must" to be achieved.

Initial contacts were made with the team and individual sport Federations asking for information concerning :

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<sup>4</sup>This category was comprised of male athletes only.

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- The teams which participated in the national categories of interest during the competitive season 1991-92 (first competitive round), the athletic calendar (for the second competitive round), and the names and telephone numbers of coaches.
- The athletic clubs (only for those which had a tradition on the sports under investigation or recommended by the Federation) the athletic calendar for the 1991-92 and the names and telephone numbers of coaches.

The purpose of this request was explained to them and their cooperation was sought. Since they could not provide full information at that time, they promised to send the information as soon as it was available. However, only the volleyball Federation responded to this inquiry. Thus, it was decided to contact them again. This attempt proved more fruitful, although some Federations were not willing to provide the coaches' telephone number and/ or address. This obstacle could be overcome in part by visiting coaches at the sport halls. In fact, it was the intention of the author whenever possible, to contact coaches or team administrators in person and ask for access to their teams/ athletes. This strategy is very time-consuming but almost always successful. The logic of doing so is that it is easy for people to deny cooperation to a person they do not meet personally and only talking to him/her through a telephone line, but, it is more difficult when they are face to face. However, it was impossible to adopt this strategy for contacting all coaches. This was especially the case as far as teams from some cities were concerned. Often an arrangement had to be made in advance because for several reasons the time and place of athletes' daily practice changed. To overcome this obstacle, the assistance of



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players, coaches or team/ athletic club administrators who were familiar to the author and had connections with members or the coach of teams or clubs of interest was asked. In fact, the combined efforts of those people yielded satisfactory results. The next step then was the direct contact with the coaches.

Regardless of the contact, in person or through the telephone, many times a follow-up telephone had to be made to confirm the access and arrange a subsequent appointment. The meetings took place about the middle of second round of the competitive period, with regard the team sports. This time was chosen for the following reasons:

It was competitive period for all team sports, although the competitive period is not usually of the same length among different team sports and/or for both sexes of the same sport. The study came at a time which was approximately the middle of second round for all of them. Priority was given to the sports with a shorter competitive period (e.g. volleyball players of both sexes had a shorter competitive period than handball players and the competitive period for the female volleyball athletes was shorter than for the male volleyball athletes).

At that particular time competitive preliminary events for athletes of a wide range of individual sports took place and /or for some of them the end of competitive period (second competitive round) of team sports coincided with their own Pan-hellenic events. That means that, this period was crucial for most of the athletes of both individual and team sports. On the other hand, it was far from easy for the researcher to gather the data from athletes of different sports since the events took place not only in different sport halls of the same city and almost always at the same time, but also in other cities.

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However, this fact was a great advantage for the research because the intention in the study was for all athletes to be tested in the same season.

#### ADMINISTRATION OF THE QUESTIONNAIRES

Administration in a Training Session : The researcher visited the places where athletes had their daily practice and was introduced to them by their coach. Although information about the purpose of the study, the legal assurance about confidentiality, the anti-social desirability instructions along with the directions for the completion of the questionnaire were provided in writing, the researcher stressed the main points verbally as well, and also that athletes could have access to their own results. This was done in order to make sure that everything was clear to the athletes and to motivate them to respond honestly to the questionnaire. After the instructions were given to them, the Athletic Aggression Inventory (AAI) (and the Sport Competition Anxiety Test (SCAT)) was distributed under the title "Questionnaires for athletes." Participation was voluntary and most of the athletes contacted agreed to complete the questionnaire. Only a few athletes refused to answer without giving any excuse. There have been times that the author had to visit the same team or athletic club more than one times in order to contact the athletes who for various reasons (e.g. some of them were soldiers, or students, etc.) were absent at the first time. However, these continuous attempts were not always successful. For this and other reasons regarding the screening of data (e.g. outliers) (see Appendix 12) the sample size for each measure and categories was unequal.

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Careful attention was paid to the time and place for obtaining athletes' responses. In all but a few cases, the completion of the questionnaire was carried out at the end of the daily training in the presence of the researcher or her assistant. Only in a few occasions, because of compelling reasons, were athletes' responses received prior to their daily practice. If athletes could not complete the questionnaire at that time another appointment was arranged for this purpose. The researcher wanted to make sure that the questionnaires were completed by the athletes themselves in the emotional state that training and interaction with teammates or the coach might create.

The testing sessions averaged approximately 15 to 20 minutes (for both the AAI and SCAT). No one was allowed to disturb athletes during the testing time. After completion the questionnaires were returned to the researcher. Athletes were also informed that another shorter questionnaire (the CSAI-2) would be administered to them soon prior to a competition.

The same procedure for the collection of the questionnaires was carried out with all athletes of the aforementioned categories. Only in a few cases was the researcher not present at the administration. Written instructions were given to persons who had research experience and undertook the distribution of the questionnaires. The same procedure was followed by them. In addition, subjects were given an envelope together with the questionnaire and instructed to return the completed questionnaire into the envelope. This was done to secure the confidentiality of their responses.

Overall, 840 usable questionnaires were obtained for the total sample category for the AAI.

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**THE ATHLETES AGGRESSION INVENTORY (AAI) - Main Study :** The AAI was administered to contact and non-contact sports athletes. Analyses similar to those described for the pilot study were performed to test the reliability and construct validity of the measure. This was done because for a new questionnaire, as was the AAI, the psychological properties are deemed as being established when the measure produces similar factor solutions for at least two different samples, and the factors provide acceptable internal consistency. The reliability coefficients, ranging from .67 to .79, appeared to be satisfactory but lower than the ones of the pilot study (Appendix 14, Table A.14.5, and Table A.14.6). This was also the case with regard to the item to subscale correlation (Appendix 14, Table A.14.1 to Table A.14.4). Given the results from the pilot study, higher reliability coefficients were expected since the same procedure had been followed and in addition a larger sample size was employed for the analyses. However, it should be noted that, the sample comprised of athletes from a greater number of sports and possibly the lower coefficients are due to the lack of sample homogeneity.

Principal components factor analysis with varimax and oblique rotation was performed to examine the construct validity of the measurement. According to the results which are shown in Appendix 14, Table A.14.7, the same factor structure emerged once again confirming the three factor solution of the pilot study (Form B) with one exception. The item "I meet the unexpected aspects of the game with self-control and adjust to the new situation" from the honest aggression scale (number 2 on the inventory) had a higher but negative loading on the angry aggression scale. Further inspection of the

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reliability, however, revealed that deletion of this item resulted in a noticeable drop in internal consistency of the factor. The fact also that this item was negatively loaded on the angry scale indicates the item's inverse relationship with the angry scale. Thus a decision was made to retain this item in the honest scale. On the other hand, the items 2, 6, 22, and 23 had factor loadings under .40. However, this does not pose any problem to the validity of the scale because the criterion of .40 for factor loadings was used in the pilot study, although factor loadings of .30 are acceptable as well (Devellis, 1991).

Overall, it appeared that the data provide substantial evidence that the Athletic Aggression Inventory reported can serve as a vehicle for further understanding of athletes' aggressive behaviour. The inventory is easy to administer and interpret and is suitable for males and females across contact and non-contact (individual and team) sport categories. Reliability and validity have been supported, at least to encourage further investigation.

#### PHASE 3: RESULTS

In view of the satisfactory psychometric properties of the Athletic Aggression Inventory (AAI), the main research data for testing the hypotheses of the study was analysed. In the following section the hypotheses regarding differences due to sport category and gender (independent variables) and the athletes' aggression will be tested.

As mentioned earlier in this chapter, for various reasons, the sample size (N) of measure(s) employed in this investigation varied across categories. The presentation of results will be made separately

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for the total sample (All;  $N = 840$ ), male athletes ( $N = 558$ ), female athletes ( $N = 282$ ), contact sport (C-S;  $N = 446$ ), non-contact sport (NC-S;  $N = 401$ ), team sport (T-S;  $N = 453$ ), and individual sport category (I-S;  $N = 394$ ). Means and standard deviations of the AAI (as well as of the SCAT and CSAI-2) measure(s) are listed in Appendix 13.

For study I as well as for study II and study III, data were analysed on the Amdahl 5890 mainframe computer under the CMS operating system using the Statistical Package for Social Sciences (SPSS).

Throughout the study I, one-way analyses of variance (ANOVA), using the MANOVA procedure and one-way multivariate analyses of variance (MANOVA) with subsequent stepdown analyses were performed. However, in order to use multivariate analyses a set of assumptions should be met. Evaluation of assumptions was done before the main analyses, as described in Appendix 12. Given that the required assumptions were met to a satisfactory degree, it was decided to proceed to the main analyses. Aggression types (honest, cynical, angry) were the dependent variables (DVs) while gender and sport category were the independent variables (IVs). The Pillai's criterion was adopted for assessing the significance of multivariate effects because the sample sizes were unequal (Tabachnick & Fidell, 1989).

When significant main effects emerge from MANOVA, it is appropriate to investigate further the relationships among the independent variable and dependent ones. As Tabachnick and Fidell (1989) suggest, the appropriate statistics to clarify the relationships are correlations, univariate  $F$ 's and stepdown  $F$ 's. Correlations provide information regarding the degree to which dependent variables are

correlated and, therefore, about the independence of behaviour. When the DVs are correlated in excess of .30, stepdown analysis is considered appropriate. Stepdown analysis is a form of analysis of covariance in which "the criterion variables are entered in a specific order to test the relative contribution of successive measures" (Roy, 1958; in Bray & Maxwell, 1985, p. 48). Stepdown analysis has also the advantage that allows a statistically pure look at the significance of dependent variables, in context, with the Type 1 error rate controlled. It should be noted here that, in order to correctly interpret the pattern of stepdown F's, knowledge of univariate F's is also required. Univariate F's are produced by default in SPSS MANOVA along with the multivariate tests of significance.

For the dependent variables which achieved significance in stepdown analyses the relevant adjusted marginal means rather than sample means are needed for interpretation. Multiple comparison of adjusted marginal means would be the best way to establish the source of variation between groups. However, this approach was not adopted since there was not the facility in SPSS for doing multiple comparisons within MANOVA. Thus, when comparisons of more than one pair of means had to be done, the SPSS ONEWAY procedure was used to perform (univariate) F-tests of unadjusted means, using the Bonferroni option to perform multiple comparisons (Klockars & Sax, 1986). The Bonferroni technique provides a powerful method of controlling the experimental error rate for any set of contrasts (Bray & Maxwell, 1985).

For the sake of economy, multivariate main effects will be described in detail only for the total sample (All), while for the main effects for sport categories the interested reader is referred to

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relevant tables. For the same reason, results of the univariate analyses of variance (ANOVAs) multivariate analyses of variance (MANOVAs) for the athletic types of aggression subsection will be presented in Appendix 15.

#### DIFFERENCES IN ATHLETIC TYPES OF AGGRESSION

##### a) DIFFERENCES IN ATHLETIC TYPES OF AGGRESSION AMONG ATHLETES OF DIFFERENT SPORT CATEGORIES

It was hypothesized that the nature of sport and by extension sport category, might affect to some degree athletes' aggressive behaviour. Thus, one of the goals of this study was to find out whether there were significant differences in aggression types among athletes of different sport categories.

In order to test the above hypothesis, one-way MANOVA was performed. Since significant main effects emerged from MANOVA, the investigation of the relationships among the independent and dependent variables was deemed necessary. Pooled within-cell correlations between the dependent variables were in excess of .30, thus stepdown analysis was the next step.

As can be seen by Table 3.3.1, sport category achieved an overall significant effect (Pillais  $p < .001$ ) with cynical aggression making the sole contribution to the composite variable, stepdown  $F(3,836) = 16.71$ ,

**Table 3.3.1 : Multivariate Analyses of Variance of the Athletic Types of Aggression as a Function of Sport Category**

| Category  | Effect .. Sport Category |          |           |          |       |
|---|--------------------------|----------|-----------|----------|-------|
|   | Pillais                  | Approx F | Hypoth DF | Error DF | Sig F |
| All   | .064                     | 6.032*** | 9.00      | 2508.00  | .000  |
| Signif. Level : * $p < .05$ ** $p < .01$ *** $p < .001$ |                          |          |           |          |       |



$p < .001$  (Appendix 15, Table A.15.1).

Angry aggression, on the other hand, had a significant univariate  $F$  (Appendix 15, Table A.15.2) but not a significant stepdown  $F$ . In this case, interpretation is straightforward; the variance the dependent variable shares with the independent variable is already accounted for through the overlapping variance with one or more higher priority dependent variables (Tabachnick & Fidell, 1989).

Furthermore, the Bonferroni procedure revealed that there was a significant difference between team contact (mean = 2.64) and individual non-contact sport athletes (mean = 2.92) with the later scoring higher in cynical aggression (and therefore were lower on this factor<sup>5</sup>) than athletes of other categories. Individual non-contact athletes also differed significantly from team non-contact ( $M = 2.74$ ) and individual contact athletes ( $M = 2.64$ ).

Overall, these results suggest that contact sport athletes were more cynically aggressive than were non-contact sport athletes. Also, individual non-contact sport athletes were the least cynically aggressive whereas team contact athletes (and individual contact sport athletes with almost identical scores) were the most cynically aggressive.

#### b) GENDER DIFFERENCES IN ATHLETIC TYPES OF AGGRESSION

In order to examine possible differences in aggression types of athletes due to gender, a one-way MANOVA was performed. A significant multivariate main effect for the total sample ( $N = 840$ ) was revealed

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<sup>5</sup>Note: For all AAI scales, a lower score indicates a higher level of aggression.

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for gender (Pillai's  $p < .001$ ) (Table 3.3.2). Two of the AAI factors achieved significance, that is, honest aggression,  $F(1,838) = 29.64$ ,  $p < .001$ , and cynical aggression  $F(1,838) = 15.86$ ,  $p < .001$  (Appendix 15, Table A.15.3).

**Table 3.3.2 : Multivariate Analyses of Variance of the Athletic Aggression Types as a Function of Gender**

| Effect .. Gender<br>PILLAIS Multivariate Tests of Significance |         |         |        |          |       |
|--|---------|---------|--------|----------|-------|
| S-Category   | Pillais | Exact F | Hyp DF | Error DF | Sig F |
| All  | .053    | 15.523  | 3.00   | 836.00   | .000  |
| Contact  | .019    | 2.995   | 3.00   | 442.00   | .031  |
| Non-Contact  | .079    | 11.386  | 3.00   | 397.00   | .000  |
| Team   | .028    | 4.339   | 3.00   | 449.00   | .005  |
| Individual   | .136    | 20.511  | 3.00   | 390.00   | .000  |

Furthermore, to test for gender differences in aggression types across sport categories, one-way MANOVAs were conducted. The results revealed significant multivariate main effects for contact sport (Pillais  $p < .05$ ), non-contact sport (Pillais  $p < .001$ ), team sport (Pillai's  $p < .01$ ), and individual sport (Pillai's  $p < .001$ ) (Table 3.3.2).

A summary of findings from univariate analyses of variance and stepdown analyses for the effects of gender on aggression are shown in Appendix 15 (Table A.15.3 and Table A.15.4).

With regard to the total sample, all dependent variables, honest, cynical and angry aggression contributed to the composite dependent variable distinguishing between male and female athletes. The greatest contribution was made by honest aggression, stepdown  $F(1,838) = 29.64$ ,  $p < .001$ . Results indicated that males scored lower in honest aggression

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(mean HAG = 1.78,)<sup>6</sup> than did females (mean HAG = 1.93) and therefore they were higher in this type of aggression. A significant contribution was made also by cynical aggression, stepdown  $F(1, 837) = 12.24$ ,  $p < .001$ . Male athletes were more cynically aggressive (mean CAG = 2.69) than their female counterparts (mean CAG = 2.83). The least contribution was made by angry aggression, stepdown  $F(1, 836) = 4.13$ ,  $p < .05$ . Males scored higher (mean AAG = 2.56), thus they hold lower levels of angry aggression than females (mean AAG = 2.53). However, it should be noted here that, univariate  $F$  was not significant for angry aggression. There was no difference in unadjusted means between males and females. Once honest and cynical aggression were controlled for statistically (as covariates), angry aggression showed a significant difference in adjusted means between males and females.

There were significant differences between males and females in terms of aggression types across the four sport categories (Table A.15.3). With regard to contact sport, the only contribution to the composite variable was made by honest aggression, stepdown  $F(1, 444) = 6.23$ ,  $p < .05$ . This was also the case for team sport category, stepdown  $F(1, 451) = 10.01$ ,  $p < .001$ . For non-contact sport category, the greatest contribution was made by honest aggression, stepdown  $F(1, 399) = 20.68$ ,  $p < .001$ , followed by angry aggression, stepdown  $F(1, 398) = 4.18$ ,  $p < .05$ , and the least contribution was made by cynical aggression, stepdown  $F(1, 397) = 8.65$ ,  $p < .01$ . By contrast, cynical aggression made the greatest contribution to the composite variable for individual sport category, stepdown  $F(1, 392) = 35.41$ ,  $p < .001$ , followed by honest

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<sup>6</sup>Since the scales of the AAI (and CSAI-2) are comprised of different number of items, the average scores were used for MANOVA.

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aggression, stepdown  $F(1,391) = 18.12$ ,  $p < .001$ , and angry aggression, which alike for total sample category, took on importance in stepdown analysis, stepdown  $F(1,390) = 5.78$ ,  $p < .05$ .

With respect to honest aggression the results revealed the same pattern of behaviour across sport categories. Males appeared to hold higher levels of honest aggression (Contact sport mean = 1.77, Non-contact sport mean = 1.78, Team sport mean = 1.78, Individual sport mean = 1.79) than did female athletes (Contact sport mean = 1.87, Non-contact sport mean = 1.97, Team sport mean = 1.89, Individual sport mean = 1.99).

Further, the results showed that there were no significant differences between sexes due to cynical and angry aggression for both contact and team sport categories, suggesting that males and females of these categories behave in similar ways in -competitive- sport situations. There were, however, significant gender dissimilarities in terms of cynical aggression for non-contact sport athletes. Non-contact sport males were more cynically aggressive (CAG mean = 2.80) than females (CAG mean = 2.94) but they (males) were less angry aggressive (AAG mean = 2.64) than females (AAG mean = 2.54).

Significant differences were also found with regard to individual sport athletes, with males once again holding higher levels of cynical aggression (CAG mean = 2.73) but lower levels of angry aggression (AAG mean = 2.59) than did female athletes (CAG mean = 3.08, and AAG mean = 2.46).

**PHASE 4 : DISCUSSION OF ATHLETIC TYPES OF AGGRESSION**

One of the purposes of this study was to examine the aggressive behaviour of athletes across (sport) categories. The Athletic Aggression Inventory (AAI) was developed in order to facilitate such an examination. It was structured with the intention of measuring the aggression types athletes exhibit in sport situation. Three factors emerged as a result of the factor analysis of the AAI. These, according to Hodgson's conceptualization are related to honest, cynical, and angry aggression. The reliability and validity of the instrument was tested and found to be satisfactory.

**Athletic Types of Aggression and Sport Category :** The results from MANOVA supported in part the hypothesis of the study (2.1.1) revealing that the type of sport was related to athletes' aggression. In particular, it was found that athletes of different sport categories did differ in the cynical and angry type of aggression (although only the latter type had a significant univariate F). With regard to cynical aggression the results demonstrated that individual non-contact sport athletes were significantly lower in this type of aggression than were athletes of the other sport categories namely, team contact, individual contact, and team non-contact sport category. However, it is worth noting that mean comparisons between sport categories showed that : a) contact sport athletes were more cynically aggressive than non-contact sport athletes; b) individual-contact and team-contact sport athletes hold almost identical scores in cynical aggression.

The significant difference (at the .001 level) in cynical aggression between team non-contact (mean = 2.74) and individual non-

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contact sport athletes (mean = 2.92) can be interpreted by giving several explanations. It may reflect the competitive orientations of athletic teams included in each sport category as well as the nature of the particular sports and their competitive structures. The emphasis on outcome which athletes of this study may have assigned could be the critical factor for this difference rather than the team-individual cut distinction. Winning is important for all athletes competing at a high level, but the meaning of it may differ from sport to sport. In other words, athletes of individual sports such as swimming and weight-lifting more often measure success with specific performance scores, and personal records. An individual sport such as wrestling and boxing clearly emphasizes outcome, as match outcome is the typical measure of success. Results of Gill and Dzewaltowski's (1988) study of competitive orientation confirmed this assumption indicating that wrestlers scored significantly higher than every other team (e.g. female swimmers, female track athletes, male gymnasts) on outcome orientation and conversly wrestlers were lower than other team athletes on performance orientation. This is also the case with athletes of team sports who emphasize the team outcome rather than the individual performance statistics.

Athletes' belief that aggression is important for success as it contributes to team spirit (Alderman, 1974) is another explanation. The comment made by Alderman (1974) might add to our understanding of the observed difference. He noted that aggression, competition, and dominance behaviours appear usually in peer group interactions. The need for aggressiveness which a child learns in peer interactions is transmitted by other children. The child who interacts with a larger

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number of children probably learns to be more aggressive than one who has less encounters with other children. It could be argued that the interactive nature of the team sport, even of the non-contact ones, provides much more opportunities for aggression to team athletes than to individual non-contact athletes; thus the former have a greater history in aggression than individual non-contact sport athletes. This may be related to the fact that team members enjoy more social support than individual sport athletes. According to Smith (1986), the individual nature of the sport reduces the level of social support received from peers. As the results of Perry and Gillespie's study (1975) indicated "social support plays such a powerful part in shaping attitudes that it is difficult to find individuals who do not enjoy the reinforcement of perceived if not real social support" (p. 66).

In a study conducted by Jaffe et al. (1981), physical aggression, its escalation, and felt responsibility for it, were compared in group and individual action of Israel natives and of European new immigrants to Israel. According to the overall pattern of findings, groups were found to behave more aggressively than individuals, inflicting more severe physical punishment on their victim. In addition, aggressive behaviour in groups increased sharply from the first to the second trial block and then reached a plateau; in individuals, on the other hand, it showed hardly any increase across trial blocks. Jaffe et al. (1981) pointed out that, these findings lend cross-cultural generality to the observation that collective aggression tends to be greater than individual aggression. It is important to note that subjects of Jaffe's study aggressed against the victim without any prior provocation; they did so simply because they were asked to administer punishment to the

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victim. As he further noted, while not motivated by anger or hostility, this form of aggression, that is "instrumental aggression" represents a large proportion, if not the majority, of aggressive and violent acts perpetrated in the population at large.

Another explanation can be that for contact and team non-contact athletes aggression seems to be a more legitimate means to get success than for individual non-contact athletes (Pilz, 1979). Given that the nature of contact and team (contact, non-contact) sport provides such opportunities to gain advantages -using often illegal behaviour- it is not surprising that, more than anybody else, athletes of these categories resort to such behaviour. As Smith (1974a; p. 165) stressed "illegal tactics and tricks of the game are both encouraged and taught that rough play and physically aggressive performance are strongly encouraged, and that sometimes players are taught the techniques of fighting." Athletes evaluate the game situations and realize from past experiences that in particular situations, even if caught, an illegal behaviour could result in a tactical advantage. The intentional violation of rules in order to gain an advantage has been argued by some to be essentially cheating (Fraleigh, 1979; in Silva III, 1981). Furthermore, cheating, as it has been noted earlier, is one of the components of cynical aggression.

With regard to the overall comparison of the means, it has been shown that contact athletes exhibited higher levels of cynical aggression than non-contact athletes. At first, this finding seems to support the contention that aggression is an "essential aspect" of physical contact sport (Davidson, 1989). As Gankell and Pearton (1979) have pointed out, "the greater the frequency of physical contact, the



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greater the likelihood that aggressive behaviour will be exhibited by the athletes" (p. 14). Cross-cultural evidence, however, indicates that aggression is not an inherent aspect of athletic competition, even though it seems to have become a natural part of some sports (e.g. ice hockey).

In the same vein is Smith's (1971; in Fisher, 1976, p. 286) viewpoint who characterized aggression and violence as inevitable "by-products" of some sports. He suggested that this is due to the emphasis given on collision and intentional contact as part of the game and that success depends upon the magnitude of the collisions.

Trying to understand this phenomenon several explanations have been given. Of particular interest is the Birch-Veroff (1966; in Alderman, 1974) position and specifically the determinant of "availability." The Birch-Veroff thesis as cited by Alderman states:

"Availability is the extent to which a particular stimulus situation **makes available** a particular course of action. All situations give rise to or permit certain activities. Thus, the milieu of a basketball game for instance (the competition, the opponents, the crowd, the actual physical movement, etc.) acts as a stimulus to one or more of a variety of responses within the individual, and, in a sense, makes available for these responses to be expressed in actual, overt behaviour. Thus, in a game, aggressive activity by an individual can be explained simply in terms that the game itself (milieu) made available or released the aggressive behaviour observed in one or all of the contestants. It is also reasonable to assume that some sports (and their peculiar specific milieus) have more of a releasing capacity for aggression than others. Football, rugby, ice hockey, boxing, wrestling, judo, etc., the so-called physical contact sports, may provide or make available, aggressive responses more than non-contact sports such as track and field, tennis, golf, swimming, skiing, etc.. So the presence of aggressiveness in a boy in the former category of sports or its absence in the later category, may simply be a function of the situational aspects of the particular sport." (Alderman, 1974, p. 241).

Another interesting explanation is the one provided by Smith (1971; in Fisher, 1976) that athletes display aggression even when they have no desire to do so because it is expected by them. Thus, in a

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sporting context, a team member may conform to group expectations because he or she values team cohesion and so try to gain unfair advantage despite the personal judgement that cheating is wrong. Some of the psychological costs of membership in cohesive groups include increased perceptions of responsibility for the group and its members, and increased tendency to make sacrifices for the group and increased pressure to conform to group norms and expectations (Prapavessis & Carron, 1996). Group moral norms that support aggression and cheating have been investigated in relation to team cohesion (Shields et al., 1995). It was found that, high levels of task team cohesion were associated with beliefs that peers and coaches accepted aggression and cheating. With respect to the impact of the "moral atmosphere" on an individual's moral reasoning and action Higgins et al. (1984) stated that moral action takes place in a group context which influences profoundly the moral decision-making of individuals. "Individuals moral decision in real life are almost always made in the context of group norms .. and is often a function of these norms" (p. 75). The Stephens and Bredemeier's (1996) findings are consistent with the theorizing on moral atmosphere. Their study revealed that female athletes' perceptions of their team's pro-aggression norm and their own moral motives were highly influential in determining participants' own likelihood to aggress against an opponent in a soccer context. Their finding showed that likelihood to aggress was related to player's perception of the team norm. According to Stephens and Bredemeier (1996), every sport and team develops a unique moral atmosphere within which decisions are made about "proper" behaviour in particular situations. This moral atmosphere is a dynamic process. Variables that

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interact in this process could include the nature of the sport (e.g. contact), the competitive structure of the league, the motivational orientation of significant others, the moral dialogue that takes place within the team setting, and the cumulative experiences of players who make up the team. This is not, however, to say that there are not instances when an athlete may value winning to such an extent that cheating is personally acceptable despite group expectations not to cheat (Lee & Cockmann, 1993).

There is also the view that athletes of contact sports use aggressiveness as a means to "survive" in their sport (Papanek, 1977). Some athletes believe that when they resort to aggression they receive attention, the respect of their teammates, and "enhance face" (Widmeyer, 1984). This latter view is supported by Slaby and Guerra (1988) findings which indicated that aggressive adolescents were likely to believe that aggression enhances self-esteem. It is thought that athletes' successful image may be closely associated with aggressive behaviour. To be successful, especially athletes of physical contact sports, they must avoid being intimidated (Alderman, 1974).

Athletes use also aggression to intimidate their opponents in order to inhibit the opponent's performance. The following portion of an interview with a defensive football player, is an example of this "scare" tactic (Fisher, 1976):

"You know when I'd meet Jim ... this week I'd try to take a lot out of him the first time I tackled him. I tried to let him know that I'm there.... I'm not trying to hurt him or anything. I'm trying to put a fear into him so when he, so if he happens to get through that line and he don't want to break my way, he wants to break away from me, see! ..." (p. 286).

The aforementioned, as well as the research findings cited in the review of the literature strongly support the view that aggression in

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sport is the product of socialisation (Tenenbaum et al., 1997). The finding of significant differences in cynical aggression across categories is in line with the findings of Silva's (1983) study which clearly showed that the amount of contact and involvement in organized sport is closely related to the aggression exhibited by his subjects. Bredemeier et al.'s (1986) findings are supportive of Silva's findings. Recently Weinberg and Gould (1995) have also noted that the focus on the winning, that is the core of the organized competitive sport, is responsible for athletes' aggressive behaviour. When athletes place strong emphasis on winning they are more likely to endorse cheating and intentionally injurious acts as more acceptable (Duda et al., 1991). The above are congruent with the social learning theory which proposes that aggression is an acquired behaviour, which comes about through direct experience and observational learning (Bandura, 1973). Bandura's theory has significant implications for sport, especially when considered in light of his statement. "People can acquire, retain, and possess the capability to act aggressively, but the capacity may rarely be expressed if it has no functional value for them or is negatively sanctioned" (p. 203). The athletes of the present study were no exception to this rule. They have been encouraged, through the years of their participation in competitive sports, to learn, adopt, and refine by direct experience, aggressive behaviours (Connelly, 1988). From the discussion above it becomes obvious that cynical aggression has functional value for athletes.

In so far as differences in angry aggression among athletes of different sport categories are concerned, it appeared that this type of aggression lost its significance when stepdown analyses were performed

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with cynical aggression showing as the higher priority dependent variable (covariate). It is not known however, whether this result implies to some extent intercorrelation between the cynical and angry types of aggression. Even if this is the case, it does not undermine the independence of these two aggression types which has been supported by the pilot and main study results. Such a finding is difficult to interpret, nevertheless, it does stress the need for further research on this issue. Keeping in mind that the AAI was completed at the end of the athletes' training practice, it could be said that the finding concerning angry aggression is somehow supportive of those of Zillmann, Jonson and Day (1974). They found that physiological arousal induced by physical exercise did not increase aggressive behaviour if the individuals knew that their increased arousal was due to exercise. Zillmann et al. concluded that when increased arousal stems from exercise, or other sources unrelated to aggression, individuals do not become more aggressive. As the studies reviewed in the relevant chapter showed, in the absence of a provocation to anger, increased physiological arousal has only little influence on aggressive behaviour (Averill, 1983). Therefore, arousal is likely to intensify aggressive behaviour only under provoking conditions (Zillmann, 1983) such as those in competitive situations. Employing a state measure of aggression during or even after competition significant differences may be revealed.

Finally, the lack of significant differences in honest and angry aggression is likely to be due to the fact that sports with "varying amounts" of physical contact were included in the same sport category (e.g. wrestling and boxing were the sports of the individual sport

category). Thus, the absence of significant differences might be attributed to the different threshold (upper or lower) for aggression of each sport. On the other hand, as Silva III (1983) has pointed out, behaviours which violate the rules can receive normative or legitimate status as the amount of physical contact/collision inherent in the sport increases. Thus, while fighting has normative status in the collision sport of ice hockey, this is not the case for the contact sport of basketball. Since the rule reinforcement structure that governs the nature of acceptable play of non-contact, contact and collision sport is different, it would not be unexpected to find athletes' perceptions of "legitimate behaviour" varying as a function of the amount of physical contact/ collision implicit in their sport (Silva III, 1983). Moreover, this finding may underline the necessity for the discrimination between contact and collision sport category, and the inclusion of the latter in the present sport categorization. It is also likely that the absence of significant differences may be due to the teams sampled in each sport and category, although the precise reasons for these findings cannot be identified from these results alone.

Athletic Types of Aggression and Gender Differences : In so far as gender differences in athletic types of aggression are concerned the results from MANOVA analyses indicated that the subject's gender is a significant variable in determining the likelihood of aggression. Specifically, significant multivariate main effects revealed that male athletes of the total sample and across all sport categories were more honestly aggressive than females.

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This finding seems to be in contrast with the hypothesis (hypothesis 2.1.2) of the study and with findings of studies conducted in the field of social psychology which demonstrated that fairness is an important value for women while males place more emphasis on winning (Blair, 1985; Gaskell & Pearton, 1979; Gill, 1988). Gill and Dziewaltowski's (1988) study also revealed gender difference for competitiveness scores, with males scoring higher than females on competitiveness and win orientation. However, a closer inspection on the honest aggression factor reveals that this type of aggression consists, among others, of items in which the capacity for attaining self-control and concentration on the task at hand is emphasized. To interpret therefore this result some other variables such as competitive experience needs to be employed. Before that, however, a comment is in order. It could be argued that fairness is not quite the same thing as honest aggression. Nevertheless, some of the values, inherent in the notion of "fair play" such as care for the personal well-being of one's self and others, efforts to achieve success and as high a standard of performance as possible, self-control in victory and defeat, to beat opponents by skill rather than by rough aggression, to maintain self-control at all times etc. (Tuxill & Wigmore, 1993), are also elements of honest aggression.

The factor of athletes' competitive experience could be stressed as being partly responsible for the finding concerning gender differences in honest aggression. Female athletes of this study were not as experienced as were male athletes, e.g. weight-lifting was a "men's sport" for long time and it was only a few years ago since women became seriously involved in this sport. Although the female weight-

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lifting athletes were the ones who participated in the national events, their competitive experience by no means compared with the competitive experience of their male counterparts. Male weight-lifting athletes on the other hand participated for many years in national and many of them in international events. In addition, more males than females get involved in sport at an early age since the later, at all ages, receive lower levels of reinforcement (Harahousou, 1996) and a higher level of verbal punishment for participation in sport (Dickinson, 1976). As a result, males have a longer sport career and competitive experience than females do. Experience on the other hand plays an important role in terms of helping athletes to maintain control and concentration on the task at hand.

Furthermore in some studies a positive correlation between sport activity and moral reasoning was found, but, there is much more evidence that sport participation may be negatively related to moral growth (Bredemeier, 1985; Bredemeier, Weiss, Shields & Cooper, 1986; Mikolajczyk, 1993). Hence, males expected to be more cynically aggressive than females across all sport categories. The results, however, demonstrated that significant differences for cynical aggression occurred only for the total sample as well as for the non-contact sport and individual sport athletes with males being more cynically aggressive than female athletes. Male athletes of the above categories also appeared to be less angry aggressive than female athletes.

Cynical aggression, according to Hodgson's conceptualisation, is the type of aggression in which athletes' morality is involved more than in any other aggression type. Research evidence concerning the



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capacity of the sexes for making moral judgments is conflicting. Some of the findings showed that boys have a greater capacity for making absolute moral judgments, some others indicated no differences between boys and girls, whilst there are findings which supported the view that girls exhibited a better capacity for moral reasoning (Keltikangas-Jarvinen, 1988). Research conducted by Bredemeier (1994) demonstrated that girls and boys did not differ significantly in their sport or life moral reasoning. This is consistent with the lack of gender differences in moral reasoning reported by Haan et al. (1985; cited by Bredemeier, 1994). Further, findings reported by Mikolajczyk (1993) enter the picture and make things more complicated. As Mikolajczyk (1993) noted, the moral reasoning level is higher in the female sample and, at the same time women cheat more. It must be noted, however, that male and female subjects of his study did not differ in years of sport participation and in sport level. Moreover, Bredemeier (1994), on the basis of her research findings on the relationship between children's moral reasoning and their assertive, aggressive and submissive action tendencies in sport and daily life contexts has pointed out that, moral reasoning scores were predictive of action tendencies, with reasoning positively related to assertion and negatively related to aggression. Recently, Stephens and Bredemeier (1996) reported findings which are supportive of the results of this study. According to them, group norms that support aggression and cheating were associated with males more than females and with individuals having more experience in the sport.

Although the findings of the present investigation seem to be more supportive of the view that females' level of moral reasoning is higher than that of males, it might be wrong to accept such an argument

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without a second thought. Since the sample of this study consisted of experienced athletes, it is likely that it was not a matter of athletes' capacity for making moral judgements. Rather, it was male athletes' choice to use cynical aggression in order to achieve their goals. As Gilligan (1977) has pointed out, "to date, the male moral ideology tends to be less concerned with fairness and sensitivity, yet more detached and impersonal" (p. 440). To this direction, differences in the socialization of males and females make a unique contribution. Furthermore, in the competitive environment of organized sport males may more readily accept rule violating behaviour as coolly calculated, expected behaviour. The work of Silva III (1983, 1984) illustrates the point. Silva III (1983) tested the hypothesis that social psychological variables influence the perceived legitimacy of rule violating sport behaviour. He found that males see aggression in sport as more legitimate than females. In addition, in a competitive environment, males more readily socialize other males to accept rule violating behaviour. The research findings of Brown (1982; cited by Silva III, 1984) on the legitimacy of aggressive sport behaviour indicated that male college athletes were more willing to use aggression than did female athletes.

Considering that athletes are aware of the consequences resulting from rule violating behaviour, this possibility seems to receive much more credit. More specifically, the outcome of such violations is deemed by athletes as being much more important and valuable for themselves and their team/athletic club. Thus, they consciously choose to be cynically aggressive. Though this form of behaviour is in contrast with the principles of fair play, it is mostly

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welcome by significant others who accept and even reinforce such behaviour. The cases of deliberate fouls and other "tricks" that coaches ask their players to use (Tenenbaum et al., 1997) are strategies well-known to everyone.

Moreover, these findings do not seem to support the notion that emphasizes the "female nature" as more prone to indirect ways of achieving a goal (Bredemeier, 1977; Berlin, 1974, Frodi, 1977). Cheating and manipulating others are components of cynical aggression and, as the results of this study revealed, there were no significant differences in cynical aggression for contact and team sport athletes. It could be said that this finding supports Frodi et al. (1977) contention that females act aggressively when they see the situation as permitting them to behave aggressively, as it is the case with contact and team sport. As Gill (1986) has pointed out, the behaviours of females and males overlap considerably. She also noted that, about 40% of females are more aggressive than the average male (it could also explain females higher level in angry aggression). This finding comes in support of those investigators who acknowledge that biological factors have some influence on behaviour, but not that biological factors are absolute determinants. Mostly relevant is Skinner's (in Dickinson, 1976; p. 102) "the nature versus nurture" discussion regarding aggression. According to him,

"Our way of life encourages it (aggression) because you often get what you want when you fly into a rage. People who annoy you then leave you alone. I suspect that this is an acquired response, because we are much more likely to get mad at people than at things.... This suggests that we have acquired our angers because they have paid off. Getting angry at a tree is not often reinforced. If we can build a world in which rage doesn't pay off, it will be a world in which people don't fly into a rage at the slightest annoyance."

A further explanation comes from Nicholl's (1989) theory of goal

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orientations. Specifically, Nicholls predicted that ego oriented individuals would be more likely to exhibit a "win at all costs" attitude which might include aggressive and cheating behaviour in their quest for victory. Research with athletes has shown that, a low task and high ego orientation was associated with a greater likelihood aggressive acts to be endorsed as more legitimate, in particular, injuring an opponent, and with beliefs such as, taking an illegal advantage would lead to success in sport. Also, it was found that approval of unsportsmanlike behaviours such as cheating correspond to an orientation high in ego and low in task (Duda, Olson & Templin, 1991). On the other hand, research has shown (Duda & White, 1992; White & Zellner, 1996) that women were more task-oriented than men. Therefore, it might be possible that the differences found in the present study may reflect differences in goal orientation of athletes of these categories. However, future research is needed in order to establish whether Greek female athletes more than males are task oriented.

The significant gender difference in cynical aggression between non-contact sport and individual sport athletes is quite interesting though difficult to interpret. A study conducted by Jacobson et al. (1970) offers an explanation. They attempted to investigate among others self-satisfaction, sex differences, and the tendency to cheat when confronted with failure. In their study, subjects were placed in an experimental situation in which they failed to meet social norms unless they cheated during a temptation period in which it appeared that cheating would be undetected. They found that subject groups with high scores on both the need for social approval and self-satisfaction

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measures were among the groups who cheated extensively. On the basis of their results, they suggested that the tendency of persons of high self-satisfaction to cheat can be understood in terms of striving of these individuals to bring congruence between their self-presentation and their failure in the experimental situation. Thus, persons with high self-satisfaction may be expected to cheat in order to maintain for themselves and others their image as successful persons.

Taking into account their suggestions together with the "nature of sport" factor (that is, athletes of non-contact sport cannot blame their opponents for illegal physical contact, whilst athletes of individual sport category are solely responsible for their behaviour and game outcome), it could be argued that male athletes of the above categories were more cynically aggressive because they felt the image they presented to themselves and others was threatened, and cynical aggression (cheating) provided an effective way of reducing such a threat (Landau, Packer & Levy, 1973). Thus, it is likely that male athletes were threatened by information that was inconsistent with their self-concept to a much greater degree than female athletes.

With regard to angry aggression the results demonstrated that female athletes of the total sample, non-contact sport and individual sport category were more angry aggressive than male athletes. This finding though not consistent with the prevailing notion that aggression does not fit the female self-image (Kidd & Woodman, 1975) is in line with evidence reported by Greenglass and Julkunen (1991). These researchers found that undergraduate female students were more likely to express their anger and show less control of their anger than males

(Type A).<sup>7</sup>

Pooley (1980) has also stressed by means of an example that, boys who seriously participate in sport, must expect, from an early age, to be involved in brawls to defend their own and their team's honor. Moreover, aggressive behaviour in response to provocation by another is considered by many as appropriate male behaviour, thus, is less likely to have a negative effect on boys' social status than on girls (Lancelotta & Vaughn, 1989). However, it should be stressed that, aggression in sport and especially at a highly competitive level, is an acceptable form of behaviour for women. Therefore, the rules that govern women's behaviour in other social settings may not apply in the sport competitive context. Eron (1980) suggested that girls are conditioned to express aggression in only a few acceptable ways, and sport is one of them. According to Frodi (1977) and her colleagues, males are more aggressive only under certain circumstances. Females on the other hand act aggressively only when they see the situation as permitting them to behave aggressive or indirectly. With respect to this finding, however, a question is generated, that is, whether the higher levels in angry aggression of female athletes of non-contact and individual sport is an indication of the inability to keep themselves under tighter self-control or a way to receive more attention from significant others (Papanek, 1977). The answer can be given only through further examination of this issue. In the same vein is Keltikangas-Jarvinen (1988) observation that "aggression has been

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<sup>7</sup> The Type A behaviour is characterized by competitive drive, a persistent striving for recognition and advancement, involvement in multiple activities involving deadlines, and excessive hostility (Greenglass & Julkunen, 1991).

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related to behaviour deficits, in the sense that if appropriate social skills are absent, the only way that reinforcement can be obtained is through deviant actions" (p. 733).

Overall, the pattern of findings of the study I concerning gender differences in aggression may be understood by Gill's (1986) statement that the gender differences that may exist are not very meaningful, since there are research findings which demonstrate that experience or training may alter these differences. As she further predicted "the changing roles of women in sport and the increasing presence of females in highly competitive, aggressive sports may be changing gender differences in aggressive sport behaviour quite dramatically" (p. 203).

## CHAPTER 4

### STUDY II COMPETITIVE ANXIETY



METHODOLOGY

Before proceeding with the study of competitive anxiety, the reader is directed to the preliminary work and guidelines (common for study I and study II) which are described in Appendix 5.

PHASE 1: THE MEASUREMENT OF COMPETITIVE TRAIT ANXIETY

The psychometric properties of the Sport Competition Anxiety Test (SCAT) as reported by Martens (1977) are presented in Appendix 10 (Table A.10.1). Below, the pilot study of this instrument with the Greek athletes is described.

Pilot Study : Richards (1953; in Candell & Hulin, 1986) has commented that "translations are perhaps the most difficult task produced in the evolution of the cosmos." Hyperbole aside, researchers agree that translations are a major stumbling block in the path of rigorous, (cross-cultural) research (Candell & Hulin, 1986; Hayashi, 1996). For instance, despite the fact that English has more than five hundred emotion-related words, some emotion words in other languages have no English equivalent (Russell, 1991). However, the research problems caused by the need to produce some kinds of translations and evaluate their properties can be handled effectively. The procedure which has been followed for the translation of the SCAT was similar to the one described for the M-C SD scale. First, the author translated the questionnaire into the Greek language, and then, it was given to both a Professor and Lecturer who were two of the judges (from the University of Athens and Thessaloniki (Greece) respectively) for the AAI. Minor corrections were carried out on the authors's translation and then the assistance of a teacher of Greek literature was asked for

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the final grammar and syntax corrections. The resulting translated version was then administered to a sample of 266 athletes together with the M-C SD scale (males  $N = 185$ , females  $N = 81$ ) (they were the same subjects who completed the AAI Form A). The data were then analyzed for examining the item to total correlation, the internal consistency and construct validity of the Greek version of the SCAT. This is, according to Eysenck and Eysenck (1983), a minimum requirement because, as Furnham and Henry (1980) pointed out, "methodologically it is important to ensure that the items on the measuring instrument are interpreted similarly by all groups (they mean cultural groups) and that a similar factor structure emerges from each group before embarking on research" (p. 43). The reliability and the item to total correlations are presented in Appendix 10, Table A.10.2.

As the results revealed, the item to total correlation coefficients are quite satisfactory. The internal consistency of the scale was examined by the Cronbach's alpha reliability coefficient. The results revealed that the reliability of the Greek version of the SCAT was as high (.85) as the one reported by Martens (1977) for the adult sample. To examine the construct validity of the questionnaire a principal components factor analysis with varimax rotation was required, but, since only one factor was extracted, the solution could not be rotated, and thus providing evidence for the construct validity of SCAT. The factor accounted for 44% of the variance.

In short, the results from the pilot study appeared to be quite satisfactory with regard to the reliability and validity of the SCAT. Thus, its use in the main study was decided without further examination.

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### PHASE 2: THE MEASUREMENT OF COMPETITIVE STATE ANXIETY

Evidence concerning the psychometric properties of the CSAI-2 is presented in Appendix 11 (Table A.11.1). The pilot studies which were carried out with the Greek athletes are now presented.

First Pilot Study : Before the administration of the questionnaire the same procedure was followed once again regarding the translation of the Competitive State Anxiety Inventory-2 (CSAI-2). With respect to CSAI-2, however, the problem in translation that always arises because of the different meaning a word may have in two different languages, was more acute. Thus, in addition, it was decided to ask the assistance of a teacher of English literature. The translated version was then distributed to 146 male university athletes, representing team contact and non-contact sports (basketball, football and volleyball). They completed the questionnaire 30 to 45 minutes approximately before their competition. There was a problem when some athletes refused to complete the questionnaire protesting that they did not have enough time for completing the test. Nevertheless, the inventory was positively welcome by the majority of athletes.

The reliability estimates were calculated by Cronbach's alpha coefficient for each of CSAI-2 subscale separately. They were found to be .80, .81, and .75 for the cognitive A-state, somatic A-state, and state self-confidence scales respectively. These reliabilities appeared to be similar to those reported by Martens, Vealey and Burton (1990) (Appendix 11, Table A.11.1).

With regard to item to subscale correlations, only one item (from the somatic A-state scale) was found to have a low correlation

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coefficient ( $r=.39$ ) compared to the correlation coefficients of the other items which exceeded the value of .50.

To assess the construct validity of the translated version of the CSAI-2, a principal components factor analysis with both varimax and oblique rotation was performed. In order to confirm the factor structure of the inventory, a three factor solution was forced. Factor loadings were remarkably similar for the two rotations. Except from the state self-confidence scale, however, which appeared to be a distinct factor, an overlap appeared between the other two factors of cognitive A-state and somatic A-state anxiety. Also, the somatic A-state item "My body feels relaxed" loaded on the state self-confidence factor.

As Spielberger and Diaz-Guerrero (1976) have stressed, the translation of a psychological inventory from the original language inevitably raises many complex theoretical and methodological problems. In order to facilitate the integration of theory and research across cultures, test translators must be able not only to understand the conceptual framework that has guided the construction of a particular psychological scale, but also to adapt and if necessary to extent this framework to incorporate relevant aspects of the new culture. In the case of CSAI-2 the instability of the structure seemed to suggest either a conceptual problem with regard to competitive A-cognitive and A-somatic or a problem due to the sample. As it had been mentioned above the sample consisted of male university athletes. They participated in the first Pan-Hellenic university championship games. Bearing in mind comments made by some athletes regarding the importance of the competitive events, it was assumed that the games were not as crucial for teams with an unsuccessful past history in athletics. They

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participated for the sake of experience rather than for winning, and is likely that some of them did not pay the proper attention on the questionnaire.

Thus, it was decided first to modify some items which appeared to be problematic and then to carry out a second pilot study. Before any attempt at modifying those items a discussion was held again with people relevant to sport psychology as well as with the teacher of English language and their opinion was sought. After the modifications were carried out, the revised Greek version of the CSAI-2 was administered to a new sample.

Second Pilot Study : This time the sample was comprised of 106 swimmers (males  $N = 61$ ; females  $N = 45$ ) who completed the questionnaire approximately 30 minutes prior to their competition. The competition was of extreme importance for them since they had to reach the qualifying time which was the criterion for allowing them to participate in the greatest event of the year that is the Panhellenic events of competitive swimming. Only few athletes reach the criterion time but still the competition was important for them because they wanted to break their own personal record.

Subjects' responses were analyzed for obtaining item to total correlation coefficients and estimates of reliability. The results are presented in Appendix 11 (Table A.11.2 and Table A.11.3).

The item to total correlations (Table A.11.2) revealed that the lowest correlation coefficient was held again by the same somatic A-state item ("my body feels relaxed"). From the same scale the item "My hands are clammy" had also lower correlation coefficient than in the

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first pilot study. It was assumed that this was due to the nature of the sport, thus athletes did not notice any particular difference regarding this physiological response of their body.

With regard to the internal consistency, an improvement in the reliabilities of A-cognitive and self-confidence factor was evident, but, the reliability of the A-somatic factor was lower this time (Appendix 11, Table A.11.3).

Factor analyses were conducted for the new data set of the CSAI-2 using varimax and oblique rotation (Appendix 11, Table A.11.4) as with the first sample. The two rotations revealed identical solutions with similar factor loadings. Once again, the results did not entirely support the distinctiveness of the three factors. Although an apparent improvement in the solution was evident, there were still three items (one from the A-cognitive scale with the number 13 on the inventory, and two from the A-somatic scale with the number 5 and 14 on the inventory which loaded on other factors. These results may be explained with what Russell (1991) referred to as emotion culture. According to Russell (1991) emotion cultures influence how people describe and categorize their feelings, producing both commonalities and differences across cultures.

In the light of these results it was decided to make a final attempt at for rewording two of the three items (item number 5 and 13) first, and then to use the revised version of CSAI-2 in the main research. The decision about which items will be retained for further analyses in the main study would be made only after analyzing the data of the main study and comparing these results with those from the pilot study.

MAIN RESEARCH

PHASE 3: THE SPORT COMPETITION ANXIETY TEST (SCAT) - Main Study

The SCAT was administered to the same athletes (N = 853) who had completed the AAI and the procedure was identical for both measures. Therefore, no further description on the administration of the SCAT will be made.

The data obtained from the main study was analyzed to further examine the psychometric properties of the SCAT. The SCAT (and CSAI-2) has been used in a number of studies and its reliability and validity is well established. However, in this study the translated version of this measure was used, thus the re-examination of SCAT's psychometric properties was deemed necessary. The results of the analyses will be presented in what follows.

The Cronbach's alpha reliability of the scale as well as the item to total correlation are similar to those obtained in the pilot study (see Appendix 16, Table A.16.1). The principal components factor analysis results with both varimax and oblique rotation supported the construct validity of the SCAT as it was expected. Only one factor was extracted and therefore the solution could not be rotated (Appendix 16, Table A.16.2).

PHASE 4: THE COMPETITIVE STATE ANXIETY INVENTORY- 2 (CSAI-2) -  
Main Study

Administration Of the Questionnaire Before Competition : The precompetitive measurement of state anxiety was decided because multidimensional anxiety theory and preliminary research with the CSAI-2 have shown that A-state components do not present the same patterns

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of change as time to compete nears. However, somatic anxiety increased during the 24 hours prior to competition while cognitive anxiety and self-confidence remained stable (Krane & Williams, 1987; Martens et al., 1990). Therefore it was expected that, at the time of questionnaire completion (about 1h prior to competition) levels of A-State components will be elevated considerably facilitating the purposes of the study. Another reason is that it often can be difficult to gain access to athletes during competition or immediately before performing, as both, coaches and athletes may find it distracting to respond to anxiety questionnaires as the competition becomes imminent. For instance, as reported by McCann, Murphey & Raedeke (1992) in a study with elite cyclists participating in a national team selection camp less than the fifty percent of the total population agreed to complete an anxiety questionnaire prior to competing in a time trial, constraining the external validity of the results. The problem is that the completion of an anxiety questionnaire may lead to an additional increase in anxiety, especially for cases in which initial anxiety is already elevated (Hackfort & Schwenkmezger, 1989) because the athlete's attention is directed to her/his current emotional state.

The procedure for administrating the questionnaire before competition was identical to the one which has been described earlier in training sessions for study I. Coaches were contacted one or two days before competition in order to remind them of their promise for cooperation and arrange the appointment. Many times the coaches were not willing to cooperate any further because, in their opinion, tests like the CSAI-2 would make athletes more anxious. Other times they were afraid that athletes would not have enough time for warming up or for



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the pre-game preparation. Finally, many of them were persuaded and the appointment was arranged about one (1) hour before competition. Also, a few times, coaches or the team administrators changed their minds on this issue just before the administration of the questionnaire. In these cases the researcher was prohibited from "disturbing" their athletes.

With regard to the team athletes the questionnaire was administered to them about 45 minutes to one (1) hour before competition. There had been times, however, for various reasons when the whole team (home or visitor) or only some team members arrived at the sport halls a few minutes before competition commenced and therefore there was no time for completing the questionnaire.

Things however were more difficult with athletes of individual sports. Because they compete in pairs, etc., and at different times, each of them had to be contacted individually. There were, however, athletes from many athletic clubs in the same sport hall, and although many of them occupied the same place for their general warm-up, some of them moved to other rooms. Since the researcher did not know them personally, the assistance of other athletes or even coaches was sought to track them down. But, these endeavours were not always successful. Even when they were located before their special warm up and there was plenty of time for them to complete the questionnaire, in the absence of their coach they refused to cooperate. The time required for the completion of this measure ranged from 5 to 8 minutes. The inventory was completed approximately 40 to 15 minutes before competition.

At this stage of the research, sometimes the help of a few people was needed for the administration of the questionnaires to team

#### Chapter 4: Study II Competitive Anxiety

athletes because, as it has been mentioned above, many times the competitions took place at the same time in different places or cities. Thus, it was impossible for one person to contact all the individual and team athletes in the sample. The persons who assisted had similar experience from participation in other projects and most important the researcher could trust them. Unfortunately, these people were not always available. This problem, in conjunction with the aforementioned ones, resulted in a sample size of 831 for this measure, but in a smaller one ( $N = 610$ ) regarding the individuals who completed all the three measures (AAI, SCAT, and CSAI-2).

The data obtained was analysed to examine the psychometric properties of the Greek version of the CSAI-2 (from the second pilot study). The item to subscale correlations as well as the Cronbach's alpha reliabilities were quite satisfactory and similar to those obtained from the pilot study.

However, these relationships were not entirely supported by the factor analyses results. Four items (two from the cognitive anxiety with the number on the inventory 4 and 13 and two from the self-confidence scale with the number 3 and 6) appeared to cluster with different scales. However, from these four items only item 13, that is "I am concerned about choking under pressure", had appeared to be the problematic item of the pilot study. The other two problematic items of the pilot study, "I feel jittery" (number 5) and "My body feels relaxed" (number 14) both of them from the somatic anxiety scale, loaded this time on the proper factor. But, items which did not pose any problem in the factor solution of the pilot study did so now. The third factor, that is somatic anxiety was quite distinct.

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These discrepancies between the two samples placed the researcher in a dilemma of which solution should be retained for further analyses (for testing the hypotheses of the study). Since elimination of the items indicated a drop in the reliability coefficients of the corresponding scales, it was decided to employ another criterion, that is the scree plot of eigenvalues. Examination of the scree plots indicated a clearer break in the three factor solution without the four items than with them. Thus, the elimination of the 4 items from further analyses was decided. The item to subscale correlations, the reliability coefficients and the factor analysis of the CSAI-2 after the deletion of the four items are shown on Appendix 17, Tables A.17.1 (a,b,c), Table A.17.2, and Table A.17.3 respectively.

Overall, it appeared that the psychometric properties of the competitive anxiety sport-specific instruments (SCAT, CSAI-2) are quite satisfactory and, therefore, can be used in the subsequent stage of the research for examining the addressed questions about athletes competitive anxiety.

#### PHASE 5: RESULTS

The analyses of the main research data (study II) for the Sport Competition Anxiety Test (SCAT), and Competitive State Anxiety Inventory-2 (CSAI-2) will be presented in this section. Specifically, the hypotheses regarding differences due to sport category and gender (independent variables) and the competitive anxiety will be tested. Since two different measures were employed for the anxiety states, the results will be presented in two sections, which are:

#### Chapter 4: Study II Competitive Anxiety

- 1) competitive trait anxiety (A-trait), and,
- 2) competitive state anxiety (A-state).

For each section, the presentation of results will be made separately for the total sample (All), male athletes, female athletes, contact sport (C-S), non-contact sport (NC-S), team sport (T-S), and individual sport category (I-S).

For the reasons which have been mentioned in study I, the sample size (N) of measures varied across categories. Information regarding the sample size of each measure, namely, the Sport Competition Anxiety Test (SCAT), and the Competitive State Anxiety Inventory- 2 (CSAI-2) and for each (sport) category as well as means and standard deviations of these measures are listed in Appendix 13 (Table A.13.3 to Table A.13.6).

As in study I, one-way analyses of variance (ANOVAs), using the MANOVA procedure and one-way multivariate analyses of variance (MANOVA) with subsequent stepdown analyses were performed. Assumptions concerning the use of multivariate analyses of this study were also examined (Appendix 12). Competitive A-trait, and competitive A-state (cognitive, somatic, self-confidence) were the dependent variables while gender and sport category were the independent variables. The statistical treatment of data and the criteria employed for assessing the significance of multivariate effects are identical to the one described in study I.

Multivariate main effects will be described in detail only for the total sample (All), while the main effects results for sport categories are shown in tables. Also, results of the multivariate (MANOVA) **and** univariate analyses of variance (ANOVA) for the

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competitive state anxiety subsection will be presented in Appendix 17 (Table A.17.4 to Table A.17.7).

### 1. COMPETITIVE TRAIT ANXIETY (A-TRAIT)

Differences across sport categories and gender were investigated through one-way analysis of variance (ANOVA) using the MANOVA procedure. Results of these analyses are presented below.

#### a) DIFFERENCES IN COMPETITIVE A-TRAIT AMONG ATHLETES RELATED TO SPORT CATEGORY

One-way ANOVA was conducted in order to determine whether there were differences between athletes of different sport categories in terms of competitive A-trait (dependent variable). Significant differences emerged for sport categories,  $F(3,849) = 9.37$ ,  $p < .001$  (Table 4.5.1).

Table 4.5.1 : Univariate Analyses of Variance of the Competitive A-Trait (DV) for Effect of Sport Category (IV)

Test of significance for SCAT using UNIQUE sums of squares:  
Summary Findings

| Source of Variation | DF      |              | F    | Sig of F |
|---------------------|---------|--------------|------|----------|
|                     | S-Categ | Within cells |      |          |
| All                 | 3       | 849          | 9.37 | .000     |

The Bonferroni technique revealed that, individual non-contact sport athletes rated significantly higher (IN-C mean = 21.19) than team non-contact athletes (TN-C mean = 20.26) and team contact athletes (TC mean = 18.77). Individual non-contact sport athletes were also higher in competitive A-trait than were athletes of individual contact (IC mean = 19.67) sport category, though this difference was not

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statistically significant. Significant differences occurred also between individual contact and team non-contact athletes.

In sum, these results indicated that, non-contact sport athletes held higher levels of competitive A-trait than did team and contact sport athletes.

##### b) GENDER DIFFERENCES IN COMPETITIVE A-TRAIT

In order to examine possible differences between male and female athletes one-way ANOVAs were employed. As is shown in Table 4.5.2, significant gender differences emerged for the total sample  $F(1,851) = 53.50$ ,  $p < .001$ , contact sport athletes,  $F(1,447) = 6.49$ ,  $p < .05$ , non-contact sport athletes,  $F(1,402) = 54.17$ ,  $p < .001$ , team sport athletes,  $F(1,451) = 24.50$ ,  $p < .001$ , and individual sport athletes,  $F(1,390) = 45.12$ ,  $p < .001$ .

Results indicated that, female athletes of all categories (All mean = 21.69, C-S mean = 20.79, NC-S mean = 22.30, T-S mean = 20.68, I-S mean = 23.46) exhibited higher levels of competitive A-trait than did male athletes (All mean = 19.22, C-S mean = 19.56, NC-S mean = 18.75,

Table 4.5.2 : Univariate Analyses of Variance of the Competitive A-Trait (DV) for Effect of Gender (IV)

| Tests of Significance for SCAT: Summary Findings |        |              |       |          |
|--|--------|--------------|-------|----------|
| Source of Variation                              | DF     |              | F     | Sig of F |
|  | Gender | Within cells |       |          |
| All  | 1      | 851          | 53.50 | .000     |
| Contact  | 1      | 447          | 6.49  | .011     |
| Non-contact                                      | 1      | 402          | 54.17 | .000     |
| Team   | 1      | 451          | 24.50 | .000     |
| Individual                                       | 1      | 390          | 45.12 | .000     |

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T-S mean = 18.51, I-S mean = 19.98). Results also suggested that both male and female individual sport athletes held higher levels of competitive A-trait, whereas team athletes held lower levels of competitive A-trait.

### 2. COMPETITIVE STATE ANXIETY (A-STATE)

#### a) DIFFERENCES IN COMPETITIVE A-STATE AMONG ATHLETES RELATED TO SPORT CATEGORY

One-way MANOVAs explored significant differences between sport categories within the components of competitive A-state. The multivariate test indicated that athletes of different sport categories were significantly dissimilar (Pillais  $p < .001$ ) (Table 4.5.3).

**Table 4.5.3 : Multivariate Analysis of Variance of the Three Subscales of Competitive A-State as a Function of Sport Category**

| Category | Effect .. Sport Category |          |           |          |       |
|----------|--------------------------|----------|-----------|----------|-------|
|          | Pillais                  | Approx F | Hypoth DF | Error DF | Sig F |
| All      | .098                     | 6.821    | 9.00      | 1818.00  | .000  |

All three CSAI-2 factors achieved significance: cognitive anxiety, stepdown  $F(3,604) = 4.13$ ,  $p < .01$ ; somatic anxiety, stepdown  $F(3,605) = 5.17$ ,  $p < .01$ ; and self-confidence, stepdown  $F(3,606) = 11.70$ ,  $p < .001$  (Appendix 17, Table A.17.4).

With regard to somatic A-state, employing the Bonferroni technique, significant differences were disclosed between team contact and individual contact sport athletes (TC mean = 1.85, IC mean = 2.04); team non-contact and individual non-contact sport athletes (TN-C mean = 1.78, IN-C mean = 1.88); and individual contact and team non-contact athletes (IC mean = 2.04, TN-C mean = 1.78). These results suggest that

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individual sport athletes from the contact or non-contact sport categories held higher levels of somatic anxiety than did team athletes. A significant difference was expected between individual contact and individual non-contact sport athletes, but as the results showed, athletes of those two categories did not differ in terms of the physiological component of A-state. Overall, means comparison among sport categories indicated that individual sport athletes were the ones with the higher levels in A-somatic.

As regards self-confidence, significant differences emerged for the same sport categories as for A-somatic. Means comparison revealed that athletes of team sports of both contact (TC mean = 3.19) and non-contact sport categories (TNC mean = 3.23) were higher in self-confidence than individual sport athletes of contact (IC mean = 2.93) and non-contact (IN-C mean = 2.89) sport categories.

Once somatic A-state and self-confidence have been controlled statistically as covariates, the sport categories showed statistically significant differences in adjusted mean values of cognitive A-state. Without allowing for the other variables, cognitive A-state did not show significant differences between (unadjusted) mean values in univariate analysis (Appendix 17, Table A.17.5).

#### b) GENDER DIFFERENCES IN COMPETITIVE A-STATE

One-way MANOVA (gender for total sample) over the CSAI-2 subscales indicated that the subject groups were significantly dissimilar (Pillais  $p < .001$ ) (Table 4.5.4). For the total sample, the factor which achieved significance was self-confidence, stepdown  $F(1,608) = 20.10$ ,  $p < .001$ ,  $\eta^2 = .03$  (Appendix 17, Table A.17.6). Results



**Table 4.5.4 : Multivariate Analysis of Variance of the Three Subscales of CSAI-2 by Gender**

| Effect .. Gender<br>PILLAIS Multivariate Tests of Significance |         |         |           |          |       |
|--|---------|---------|-----------|----------|-------|
| S-Category   | Pillais | Exact F | Hypoth DF | Error DF | Sig F |
| All  | .033    | 6.856   | 3.00      | 606.00   | .000  |
| Contact  | .003    | .344    | 3.00      | 316.00   | .793  |
| Non-Contact  | .089    | 9.778   | 3.00      | 300.00   | .000  |
| Team   | .064    | 7.389   | 3.00      | 324.00   | .000  |
| Individual   | .067    | 6.886   | 3.00      | 288.00   | .000  |

indicated that males were higher in self-confidence (mean = 3.15) than female athletes (mean = 2.92).

Separate one-way MANOVA over gender for each sport category pinpointed significant multivariate main effects (Pillais  $p < .001$ ) for three of the four sport categories (non-contact, team and individual sports).

Specifically, subsequent stepdown analyses revealed significant main effects mainly with regard to self-confidence factor for non-contact sport, stepdown  $F(1,302) = 26.33$ ,  $p < .001$ , team sport, stepdown  $F(1,326) = 12.57$ ,  $p < .001$ , and individual sport category,  $F(1,290) = 18.11$ ,  $p < .001$ . As for the total sample, males were higher in self-confidence across the three sport categories (N-C mean = 3.19, T-S mean = 3.30, I-S mean = 3.02) than females (N-C mean = 2.82, T-S mean = 3.07, I-S mean = 2.66). Looking at mean scores for males one can observe that male team sport athletes were the most confident about the impending competition while the individual sport athletes were the least confident. This was also the case for female athletes of those categories.

With regard to A-cognitive, significant differences between sexes

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were found only for team sport athletes, stepdown  $F(1,324) = 5.50$ ,  $p < .05$ ,  $\eta^2 = .02$ . Means comparison indicated that male athletes held higher levels of cognitive anxiety (mean = 2.63) than did female athletes (mean = 2.19).

No significant differences found on A-somatic factor for any category. Also, there were no significant differences between male and female contact sport athletes on any factor.

#### PHASE 6: DISCUSSION OF COMPETITIVE ANXIETY

Competitive A-Trait, A-State and Sport Category : Results regarding the competitive anxiety were not entirely supportive of the hypothesis of the study (hypothesis 2.2.1). With respect to competitive trait anxiety it was revealed that, non-contact sport athletes were higher in competitive A-trait than were athletes of contact sports. One of the assumptions this hypothesis was based upon is that the threat of physical and psychological harm would be greater for contact sport athletes (Martens et al., 1990). Thus, they were expected to be higher in competitive A-trait (and A-state) than non-contact sport athletes. This finding could be attributed to athletes' experience. That is, contact athletes, through the years of their participation in sport, made themselves familiar with the idea of physical harm and accepted it as part of the game. It is also likely that the threat of psychological harm was greater for non-contact than contact sport athletes because the performance process is more highly visible for this category. For instance, non-contact athletes may experience the threat of criticism and fear of social evaluation to a much greater degree than contact athletes since the absence of physical contact makes competition

"clear"; this means that they cannot blame the opposition for illegal physical contact, "dirty" outcome and the like.

Existing research evidence provided by Ryan and Kovavic (1966; in Cooke & Alderson, 1986) is supportive of the above interpretation. These researchers investigated the ability to tolerate pain in relation to chosen sport activity. According to their results contact athletes tolerate more pain, non-athletes tolerate least pain while non-contact athletes fall along this bipolar dimension. There is also evidence that anxious individuals are more susceptible to pain and fatigue and thus they may avoid contact sports (Smith, 1970).

Results concerning differences between athletes of individual and team sport category showed higher levels of competitive A-trait for individual sport athletes than for team sport athletes (although the observed difference between individual contact ( $M = 19.67$ ) and team contact ( $M = 18.77$ ) sport athletes was not statistically significant). This finding was expected (hypothesis 2.2.1b) because some sports (i.e. individual sports) are more evaluative than others (team sports) and therefore can be more stress inducing (Martens et al., 1990; Scanlan, 1984). As a matter of fact, individual sport athletes are solely responsible for the outcome whilst team sport athletes' performance is only a part of the general action of the group.

As regards competitive A-state no significant dissimilarities were found in cognitive A-state among athletes of different sport categories. An explanation for this finding could be that athletes of all categories perceived competition in the same way and they placed to the same degree importance on their competition. This interpretation seems, however, somehow unlikely. Other reasons could account for this

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finding. Another explanation could be given through the research findings of Krane and Williams (1987). More specifically, the results of their study showed that the golfers and gymnasts had different patterns of change in the CSAI-2 subcomponents. In the present investigation, the inclusion of different sports in the same category may had a "balancing effect" which flattened/ disguised possible differences. Recent research findings of Jones and Swain (1995) offer another explanation for the absence of significant differences in cognitive anxiety among athletes of different categories. They examined the distinction between "intensity" and "direction" of competitive anxiety symptoms as a function of skill level. Elite and non-elite competitive cricketers were the subjects who completed a modified version of the CSAI-2. The findings showed no difference between the two groups on the intensity of the cognitive and somatic symptoms, but elite athletes interpreted both anxiety states as facilitative to performance than did the non-elite athletes. Further analyses showed that cricketers in the non-elite group who reported their anxiety as debilitating had higher cognitive anxiety intensity levels than those who reported it as facilitative. However, no such differences were evident in the elite group. On the basis of their results, a possible explanation could be provided for the results of the present study that, no significant evidence emerged for athletes of all sport categories because the intensity of competitive A-state components was examined. Moreover, the anxiety levels of athletes comprised the particular sport category tested in one group. Although all subjects were experienced athletes and met some criteria in order to participate in this study, however, some of them had much more experience than

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others. Indiscrimination of experience level of athletes, therefore, may have played a significant role for the present results.

As for somatic A-state, it was found that individual contact sport athletes were higher on this factor than athletes of the other sport categories. This finding seems to be congruent with Martens et al. (1990) results which demonstrated that contact sport athletes displayed higher levels of A-somatic than did non-contact sport athletes. It should be noted, however, that team contact athletes of the present study held the lower level of A-somatic while individual contact athletes held the higher level of A-somatic. Moreover, this finding may suggest that individual contact sport athletes experience higher levels of physiological arousal which leads to increases in somatic anxiety (Hardy & Parfitt, 1991). Perhaps the somatic component of competitive A-state depends mostly on the nature of sport and /or other variables such as the number of weekly training units/hours rather than the level of competitive A-trait. The view expressed by Smith (1986) that, individual sports are unusually demanding in terms of time and effort requirements, seems to support the above explanation.

The significant differences revealed between individual and team athletes of both contact and non-contact sport categories in this study, might be also due to the measurement time. That is, team athletes were administered the CSAI-2 approximately one (1) hour before competition whilst individual athletes were administered the inventory nearest to the start of (approximately 30 minutes prior to) competition. Comparing the means it appears that the individual sport athletes hold higher scores on somatic anxiety than the team athletes.

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As it has been noted in the review of the literature, research findings showed that somatic anxiety tends to increase rapidly as time to compete nears (Gould et al., 1984). One of the important findings in Kleine's (1990) meta-analysis, and relevant to this result, was that the shorter the interval between competition and anxiety measurement, the stronger the relationship. Also, the conditions under which measurement took place should be considered. The majority of individual athletes completed the questionnaire while sitting on the stands. The distance in space was not so large and the contact, visual and/or verbal with spectators or significant others was inevitable. Sports practice, on the other hand, has verified that the mere presence of spectators at any sports match makes different sociopsychological conditions on sports participants. The influence of spectators' manifestations either positive (i.e. shouts of admiration) or negative (i.e. antisocial behaviour with features of threatening or aggressive words) may be another explanation. In addition, the closed space of the halls amplifies the sound effect and it may had a negative effect on athletes (Slepicka, 1993). As it has been stressed by researchers (Morris et al., 1981; Gould et al., 1984; Martens et al., 1990) cues that elicit somatic anxiety are thought to be non-evaluative, of shorter duration, and consisting mainly of conditioned responses to stimuli and within the sporting context these would include changing-room preparation, precontest warm-up routines, game importance, and crowds.

Another comment is worthnoting. Comparing the means between individual sports athletes it appears that individual contact sport athletes were higher in somatic anxiety ( $M = 2.04$ ) than were individual

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non-contact ( $M = 1.88$ ) sport athletes. This result appears to support the notion that athletes participating in sports scored subjectively by judges (such as wrestlers, boxers of this study) have higher scores on competitive A-state than athletes in objectively scored sports (such as swimmers, weight-lifters). Martens et al. (1990) findings, however, were supportive of cognitive anxiety only and no somatic anxiety differences were found.

With regard to self-confidence factor results appeared to support the hypothesis (2.2.1b) of the study, that is, team sport athletes appeared to be higher in self-confidence than individual sport athletes. Smith (1986) noted that the individual nature of the sport reduces the level of social support athletes of this category receive from teammates. It may be possible that, this, together with the fear of negative evaluation individual athletes experience to a greater degree (Scanlan, 1984), has as a result a decrease of self-confidence levels of individual sport athletes.

Competitive A-Trait, A-State and Gender Differences : The hypothesis of the present study (hypothesis 2.2.2) concerned with this issue was confirmed with one exception. According to the results, female athletes across all but contact sport category appeared to be higher in competitive A-trait and lower in the state self-confidence factor than were male athletes. For the contact sport category no significant gender differences occurred with respect to the self-confidence factor. It could be said that this finding is in line with research evidence that females score higher on most test anxiety measures (Wine, 1980). Martens (1977) and Gill (1988) have also

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reported higher levels of competitive A-trait for females than for males. Several attempts have been made by researchers in order to provide an adequate explanation for gender differences in competitive A-trait (Bem, 1974; Brustand, 1986; Rainey & Cunningham, 1988; see the relevant sub-section in the review of the literature). The findings of their studies were conflicting and, though some insight has been provided into this issue, no definite conclusions could be reached. However, they do give some reasons for the observed differences.

For example, Rainey and Cunningham (1988) have noted that women's sports generally receive less attention than men's sports. At this point, it could be argued that this is in particular true as far as the status of women's sport in the Greek culture is concerned. Male sports, on the other hand, receive more criticism by observers. Expectancy of criticism was a part of Passer's (1983) definition of fear of evaluation. Rainey and Cunningham (1988) conducted a study in order to replicate the fear of failure and fear of evaluation aspects of Passer's study, and to explore possible gender differences in the correlates of competitive trait anxiety among athletes. They found partial support for the hypothesis that competitive trait anxiety would be related to fear of evaluation. Expectancy of criticism was positively related to competitive trait anxiety among male athletes. This relationship was not present among the women athletes. Since the focus of public attention is on men's sports and expectation of criticism play important role in their competitive A-trait, males would be expected to experience higher levels of competitive A-trait rather than women. However, in this study, as in many others, it was the women who scored higher on the A-trait factor. Therefore, other factors could



account for these results.

The view expressed by Hart (1981) may be well applicable to Greek athletes as well. Hart (1981) pointed out that the roles of being a woman and an athlete have been seen, for the most part, as incompatible and this role discrepancy has resulted in feelings of stress and anxiety for female athletes. This role discrepancy was much greater in the past. As it appears, slowly, these roles are changing. Informal sources, as well as the involvement and serious commitment of women in sport nowadays, give us good reasons to believe that this is the case (Segal & Weinberg, 1984). The study conducted by Durtschi and Weiss (1986) which examined gender differences in competitive A-trait give support to this assumption. As these researchers reported, elite female athletes were significantly lower than were elite male athletes in A-trait. Unfortunately they did not discuss this finding any further, and as a matter of fact no additional illustrative information about this difference is provided.

Andersen and Williams (1987) suggested that gender differences in competitive anxiety are due to the traditional socialization of sexes that has favoured males in terms of preparation for athletic competition. In other words, males are exposed to and taught a competitive orientation to life more so than females. The suggestion has also been made that gender differences in expectancies of success or failure may be an important factor in determining competitive anxiety. Gill, Gross, Huddleston and Shifflett (1984) proposed that competitive situations actually exaggerate gender differences in achievement cognitions, with females generally reporting less confidence and lower expectancies of success than males.

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A related line of research that has examined the tendency for females to lack self-confidence in sport and physical activity utilized Lenney's (1977) hypothesis. According to Lenney (1977), the self-confidence of females in achievement situations is influenced by situational factors such as the performance of a task considered gender-role inappropriate or socially evaluative. Nevertheless, the study of Petruzzello and Corbin (1988) with undergraduate male and female students demonstrated that even in tasks considered gender-neutral, females lacked confidence relative to males. They suggested that the individual's perception of the task is an important determinant of self-confidence, and also that this issue could be addressed in future work by utilizing a "female-type" task.

In an attempt to clear up some of the ambiguous findings surrounding this topic, Lirgg (1991) conducted a meta-analysis of the research on gender differences in self-confidence in physical activity. Coding categories included sex-type of the task, confidence measure employed, and competitive nature of the situation. On the basis of the meta-analysis results Lirgg cautioned that although males were more confident, on average these results were extremely variable and she could draw no conclusion based on this analysis alone. She did, however, find support for Lenney's (1977) contention that females show less confidence on masculine-typed tasks than males do. Lirgg (1991) further suggested that the more masculine the task, the greater the gender difference in self-confidence.

The study of Clifton and Gill (1994) answered other researchers' call by employing a feminine-typed task to assess self-confidence and gender appropriateness in college cheerleading. The results

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demonstrated that females were more confident in their abilities as cheerleaders than were males. As these researchers stressed, this result is only rarely found in the literature on gender and self-confidence, because, the few studies showing females to possess more self-confidence than males have often been dismissed as the exception to the rule. They also suggested that when assessing confidence in sports, it is important to consider separate tasks in the sport rather than simply asking one global confidence question. Clifton and Gill's (1994) findings are supported by the recent research findings of Lirgg et al. (1996), who found that males were less confident than females on a perceived feminine task, and females were less confident than males on a perceived masculine task.

Interpreting the results of the present study it could be said that, females' lower levels of self-confidence might be due to the fact that some of the sports included in the present research are perceived by Greeks as masculine type (e.g. weight-lifting). Also, the socialization processes involved with Greeks athletes sport participation may account for some differences. Females involvement in sports usually begin at a later age than males. In fact males start their sport careers much earlier, have more experience with physical tasks and opportunities to develop skills and confidence in their overall abilities than females (Harahousou, 1996; Lirgg et al., 1996).

In relation to the above another plausible explanation is offered through Lenney's (1977) review and accounts for the lower confidence levels of females relative to males. The key-points of this review are experience and social reinforcement which may play important role in the development of the self-reward system of the individual. According

#### Chapter 4: Study II Competitive Anxiety

to Lenney (1977) individuals with a well developed self-reward system have probably been socially reinforced for mastery attempts and have more experience on such tasks. Successful experiences /mastery attempts can serve to enhance self-confidence. As a result, the more experience an individual has at a variety of physical tasks in a variety of physical situations, the greater the possibilities are that his/her self-confidence can be generalized to more situations. A self-reward system, and hence self-confidence, can be developed by making independent mastery attempts. The more mastery attempts are made and rewarded, the more individuals can internalize a self-reward system that in turn enhances self-confidence (Petruzzello & Corbin, 1988). The Moritz et al's. (1996) study on the specific image content of confident athletes adds credence to the above analysis. They reported that the sport confident athletes were more likely to image incidents of mastery (e.g. coping successfully with challenging situations, giving 100% effort, handling the stress, remaining calm).

Bearing in mind this analysis together with the fact that females usually receive less reinforcement for mastery attempts in sport and physical activity than males, it is not surprising that the consequences of this treatment manifested in female adult athletes. The explanations given above such as those concerning socialization, win orientation may reflect the cultural differences that exist in Greek society, although they may not be as strong as in other social contexts. Nevertheless, this is only a speculation which can be tested only in a future investigation.

As regards the finding which indicated that no significant difference in self-confidence existed between males and females of

#### Chapter 4: Study II Competitive Anxiety

contact sport category, it corroborates Clifton and Gill's (1994) suggestion that males are not always more confident than females. This finding is also in contrast with the evidence cited above and which suggests that in neutral or masculine-type tasks (as is the case of contact sports) females are always lower in self-confidence. Prior research has also shown that males tend to report high levels of confidence in a variety of physical skills (George, 1994; Vealey, 1986). It is quite difficult to explain such a result, since, apart from the nature of the sports (contact), the history and experience of male athletes do not allow room for an adequate interpretation. Hence, only a future and in-depth investigation on this issue could help us to find out the factors responsible for female contact athletes self-confidence.

With respect to the other components of competitive A-state, the results revealed that there were no significant gender differences in cognitive anxiety (with the exception of team athletes) and somatic anxiety. This finding is not consistent with the literature on competitive state anxiety (Martens et al., 1990). In particular, the results of this investigation are in contrast with Feltz's (1988) findings who reported that females were higher in state anxiety than males. It is important to note, however, that in Feltz's study subjects were administered the State-Trait Anxiety Inventory (STAI) and they were asked to complete the inventory after a diving attempt with reference to how they felt just prior to the attempt.

Differences in competitive A-state with respect to gender were also found in studies employed the multidimensional anxiety theory. In a study Swain and Jones (1993) found that the overall somatic anxiety

#### Chapter 4: Study II Competitive Anxiety

intensity was greater in the female athletes than in males. Jones and Cale's (1989) research findings with university athletes are partly supportive of the results of the present investigation. These researchers found differential precompetition temporal patterning of cognitive anxiety, somatic anxiety and self-confidence in males and females. Their subjects were completed the CSAI-2 at six stages during the precompetition period. In the case of cognitive anxiety gender differences emerged at the last (within 30 minute) stage which revealed that females were more cognitively anxious prior to competition than males. As for somatic anxiety no gender differences were evident at any of the stages. Self-confidence remained stable in males but decreased in females on the day of competition. Furthermore, females exhibited lower self-confidence than males one day before and on the day of competition. In a study with female gymnasts, Krane and Williams (1987) also found an increase in cognitive anxiety and a decrease in self-confidence as the competition approached. The temporal patterning in Jones and Cale's (1989) study suggested that females may not conform to the patterning predicted by multidimensional anxiety theory.

The study conducted by Jones et al. (1991) replicated and extended Jones and Cale's (1989) examination of gender differences in the precompetition temporal patterning of competitive A-state components. Subjects were university athletes who were tested over the experimental period at 5 stages. A comparison of gender scores at specific stages during the precompetition period showed cognitive anxiety to be higher in females than in males at both the 2h and 30 minutes stages. The temporal patterning of males and females revealed that somatic anxiety was higher at the within 30 minutes and the 2h

#### Chapter 4: Study II Competitive Anxiety

periods than at any other time, and it was higher at the within 30 minutes stage than at the 2h stage. A comparison of gender self-confidence scores at specific stages during the precompetition period showed self-confidence to be higher in males than females at every stage of testing.

Overall, results of these studies support that cognitive anxiety and self-confidence follow a differential precompetition patterning in males and females. The explanation given by those researchers was that precompetition temporal patterning of anxiety and self-confidence may vary as a function of type of sport. This interpretation has already been provided earlier in this chapter, but, is worth noting again that due to practical considerations in each sport category of this study more than one sports included. It should also be noted that Jones et al. (1991) study revealed different factors predicted cognitive anxiety, somatic anxiety and self-confidence in males and females. It might be hypothesized therefore that a reason for the absence of significant differences in cognitive and somatic anxiety is due to the same antecedents associated with both sexes. Nevertheless, this is a speculation that warrants further investigation.

As regards gender differences in cognitive anxiety among team sport athletes it was found that females were lower in cognitive anxiety than were males. This finding is in contrast with the general hypothesis and the results from studies which supported that athletes high in competitive A-trait are also high in competitive A-state (Martens et al., 1990). It is also in contrast with the research findings of studies reported above (Jones et al., 1991). On the other hand, team female athletes appeared lower in self-confidence than male

#### Chapter 4: Study II Competitive Anxiety

athletes of the same sport category. This paradoxical finding would be explained by recalling snatches of informal conversation that the author held with some of the female athletes after the completion of the questionnaires. Female athletes (i.e. handball players) expressed complaints against the team's administrators because the attention the latter paid to problems and other matters concerning the female team was less than they deserved compared with the attention administrators paid to the male team. Perhaps these feelings of neglect, unequal treatment and injustice by the administrators affected the cognitive anxiety and self-confidence of female athletes. Another comment at this point is also in order. The higher cognitive anxiety and self-confidence for males may give support to the view that cognitive anxiety and self-confidence could be considered orthogonal (Jones & Hardy, 1990; Martens et al. 1990) and not opposite poles of a worry continuum (Man et al., 1995).

Finally, another explanation for the observed gender differences either in competitive A-trait or competitive A-state could be that females are more willing to report more feelings, particularly of an unpleasant nature, than males (Verbrugge, 1985). On the basis of his findings with collegiate swimmers, Gackebach (1982) has noted that males may be especially prone to deny performance anxiety. According to Bradburn (1969; in Jones & Cale, 1989) this difference could be attributed to socialization patterns "with males being encouraged to learn tight control over their emotions whilst females are showed a greater degree of emotional expressiveness" (p. 192). (Bradburn's suggestion could also be employed to explain the higher levels of females in angry type of aggression). Furthermore, Greenberg et al.



#### Chapter 4: Study II Competitive Anxiety

(1985) have stressed the possible effects of the greater social acceptability of the reporting of anxiety by females than males. It is possible therefore that the observed significant differences in competitive A-trait and A-state are due to the reluctance of males in this study to report their feelings because they perceive this admission as "stigmatizing."

Thus far the findings of this study make clear the implications drawn from the observations made throughout the preceeding sections. It appears that in assessing athletes' aggression and competitive anxiety additional parameters such as, experience, skill level should be considered. In addition, a combination of methods (qualitative, quantitative) and the adoption of a multi-approach to the phenomena such as direction and frequency will provide valuable information so that to progress to a greater understanding of these psychological states. It should also be kept in mind that participants in the present research were Greeks whereas participants in the reviewed studies have been from other cultures. The differences or congruence of findings could, therefore, be due to the cultural settings.

## CHAPTER 5

### STUDY III ATHLETIC AGGRESSION & COMPETITIVE ANXIETY RELATIONSHIPS

## Chapter 5: Study III Aggression & Anxiety

In study III regression analyses and crosstabulations were performed in order to examine the relationship of the athletic aggression types with competitive anxiety, and the findings will now be presented. In particular, the following subsections will be covered:

- Competitive A-trait as a predictor of the types of athletes' aggression or conversely.
- Athletic aggression types as predictors of components of competitive A-state.

Since the results of the study I and study II revealed differences in athletes' aggression and competitive anxiety for gender and sport categories, the analyses of study III were performed for each of these categories separately. Thus, the presentation of results for each section will be made separately for the total sample (All), male athletes, female athletes, contact sport (C-S), non-contact sport (NC-S), team sport (T-S), and individual sport category (I-S). Assumptions that the use of multivariate statistical analyses require were met to a satisfactory degree and are discussed in Appendix 12.

### PREDICTING ATHLETES' AGGRESSION AND COMPETITIVE ANXIETY

In this section the techniques used to predict aggression and competitive anxiety levels of athletes will be described and results will be presented below.

Since there were athletes who did not complete the competitive A-state measure (CSAI-2) (see chapter 4), for the analyses of the study III, only the cases completing all measures were employed. There was an additional reduction of the sample size since cases which have been identified as outliers for one measure had to be taken out from the

other measures as well (Appendix 12). This resulted in a sample size of N = 598 cases. The final sample size across all categories is shown in Table 5.1.

**Table 5.1 : The Sample Size of Athletes who Completed the Three Instruments Across Categories**

| Categories                 | AAI | SCAT | CSAI-2 |
|----------------------------|-----|------|--------|
| Total Sample (All) :       |     | 598  |        |
| Males :                    |     | 388  |        |
| Females :                  |     | 210  |        |
| Contact Sport (C-S) :      |     | 310  |        |
| Non-Contact Sport (NC-S) : |     | 288  |        |
| Team Sport (T-S) :         |     | 327  |        |
| Individual Sport (I-S) :   |     | 271  |        |

#### Choosing Among Statistical Analyses

Regression analysis is a powerful technique that allows one to assess the degree to which a dependent variable can be predicted from one independent variable (simple regression) or more independent variables (multiple regression). Since the main objective of the study was to assess the predictive ability of variables of interest, regression seemed to be the most appropriate approach. Specifically, it was of primary interest to test whether various levels of athletes' aggression types can be predicted by their competitive anxiety levels or reversely. The following combination of variables were looked at separately:

- a) the competitive A-trait and the athletic aggression types.
- b) the components of competitive A-state (DVs) and the athletic aggression types (IVs)<sup>1</sup>.

<sup>1</sup> For Abbreviations see Appendix A.

## Chapter 5: Study III Aggression & Anxiety

The procedure followed was of an exploratory nature and took place in four stages:

1. Data for the total sample of athletes, of each sport category, as well as for males and females were evaluated in regression analyses.
2. Predicting athletic aggression and competitive anxiety using low, medium, and high scorers' groups.
3. Evaluation of variables' predictive ability through regression plots.
4. Finally, the predictive strength of pairs of grouped variables was evaluated through two-way tables.

Results of regression regarding the predictive ability of variables will be illustrated in diagrams showing arrows and figures. The arrows were drawn from the variables which were used as independent (predictors) to those which were used as dependent (predictive).

- When the competitive A-trait was the predictor of an aggression type, a *straight-lined* arrow was used;
- When an aggression type was the predictor of competitive A-trait, *dashed-lined* arrow was used;
- *Double-headed* arrow, on the other hand, indicates that the aggression type and the competitive A-trait were equivalent in terms of prediction. In other words, each variable (aggression type and competitive A-trait) may predict the other to the same degree;
- *Straight-lined* arrows were used to illustrate the relationship between the aggression types (predictors) with the components of competitive A-state (predictive).

The figure that appears along each arrow represents significant values of  $R^2$  for regression analysis.  $R^2$  -the estimated coefficient of

determination in regression- may be interpreted as the proportion of the variation in the dependent variable explained by the independent variable. It should also be noted here that, *dotted-lined* arrows as well as the letter *x* indicate values of  $R^2$  not significant at the 5 percent level. Other information regarding regression statistics will be presented in Appendix 18.

Determining the Dependent and Independent Variables for Assessing the Relationship Between Athletic Types of Aggression and Competitive A-Trait

To the author's knowledge, there was no evidence in the literature as to whether the athletes' aggression or competitive A-trait was a predictor of the other. Thus, the decision as to which variable to use as the independent (predictor) or dependent (predictive) one was made by calculating the *Lambda statistic* for each category separately. In other words, the variables' predictive ability was to some extent evaluated by calculating Lambda (Norusis, 1991) for competitive A-trait and types of aggression in crosstabs. Results of these analyses indicated which variable was a better predictor of the other (Appendix 20). Thus, both measures were interchangeably used as predictors (IV) in some categories and dependent (DV) /predictive variables for some others.

PHASE 1: PREDICTING ATHLETES' AGGRESSION AND COMPETITIVE ANXIETY  
THROUGH REGRESSION ANALYSES

a) PREDICTING ATHLETIC TYPES OF AGGRESSION FROM COMPETITIVE A-TRAIT  
OR VICE VERSA

According to the results of the crosstabs analyses, for all but the contact sport category, and partly for females and non-contact sport category, competitive A-trait was a better predictor of athletic

types of aggression. Following, results of simple regression analyses indicated that competitive A-trait was a significant predictor of honest and angry athletic types of aggression for all but the contact sport, non-contact sport and female athletes category. For these latest categories honest and angry types of aggression were significant predictors of competitive A-trait. No significant relationship existed between cynical aggression and competitive A-trait with the exception of the male and female athletes category, where the competitive A-trait

TOTAL - S

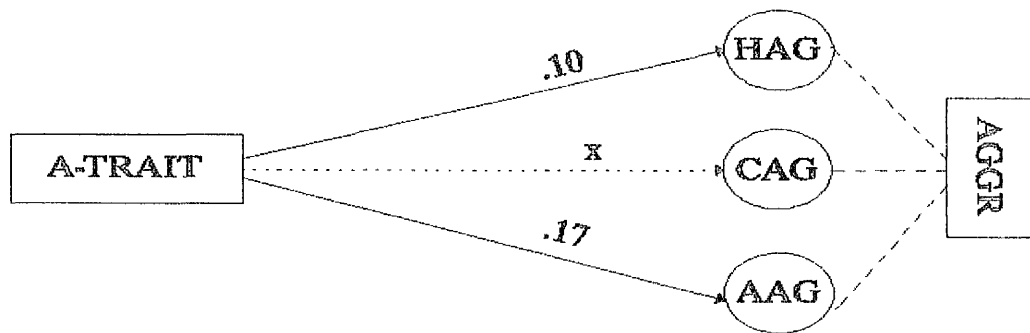


Figure 5.1.4a : Relationship Between the SCAT and AAI Measures for the Total Sample.

TOTAL - S

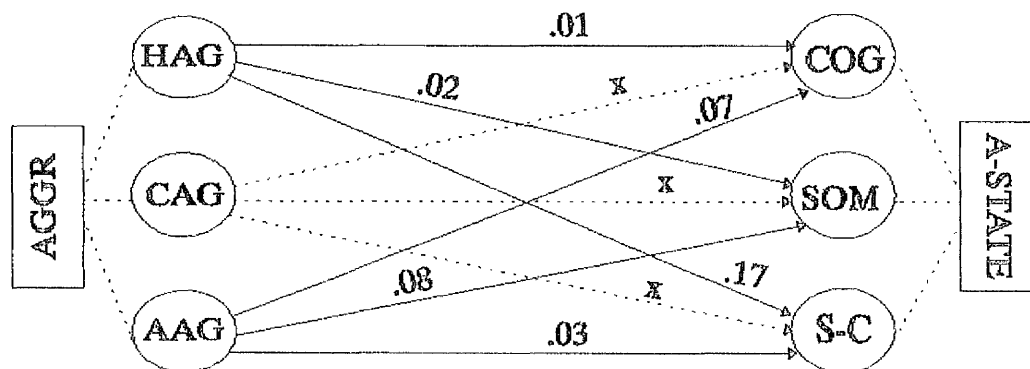


Figure 5.1.4b : Relationship Between the AAI and CSAI-2 Measures for the Total Sample.

appeared to be a weak but significant predictor of cynical aggression and reverse (Figure 5.1.4a to 5.1.10a).

In summary, the strongest and weakest effects which competitive A-trait revealed for the honest, cynical, and angry types of aggression (or reverse) are as follows:

- Competitive A-trait revealed the strongest effect on honest aggression for the non-contact sport category, accounting for 17% of the variance (Fig. 5.1.8a) and the weakest effect for the contact sport

#### MALES

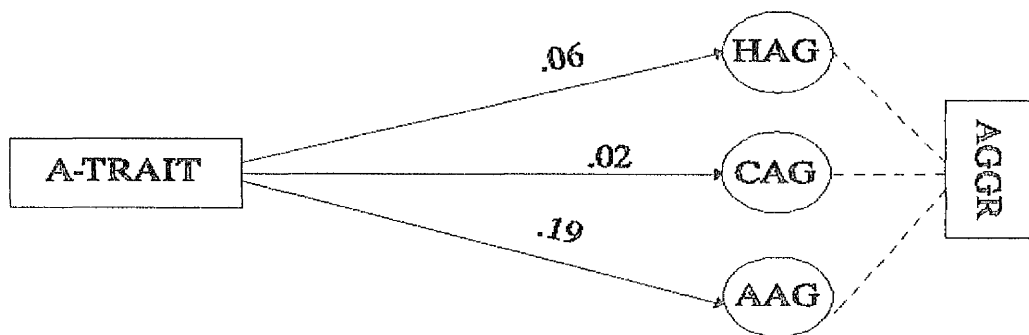


Figure 5.1.5a : Relationship Between the SCAT and AAI Measures for Males.

#### MALES

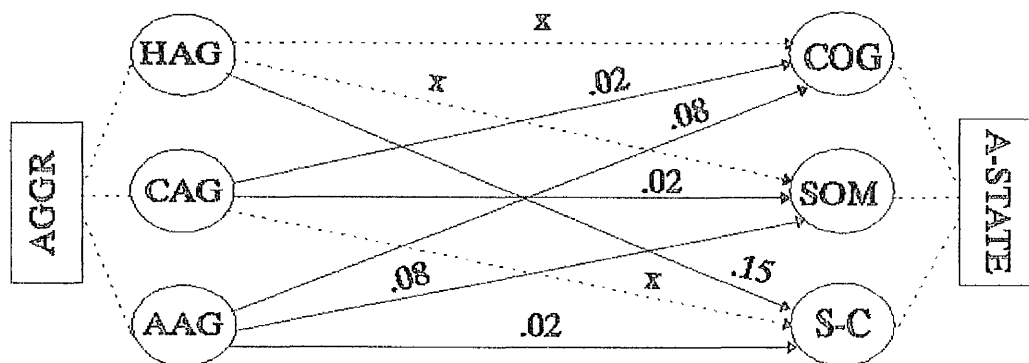


Figure 5.1.5b : Relationship Between the AAI and CSAI-2 Measures for Males.



category accounting for 4% of the variance (Fig. 5.1.7a).

- Competitive A-trait accounted only for between 3% of the variance in cynical aggression for females (strongest effect) (Fig. 5.1.6a) or had no effect at all.
- Competitive A-trait revealed the strongest effect on angry aggression for team sport category accounting for 20% of variance (Fig. 5.1.9a) and the weakest effect for females accounting for 14% of variance (Fig. 5.1.6a).

### FEMALES

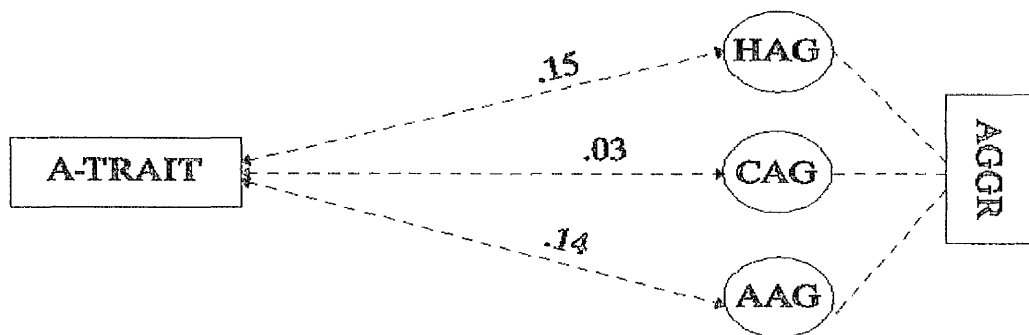


Figure 5.1.6a : Relationship Between the SCAT and AAI Measures for Females.

### FEMALES

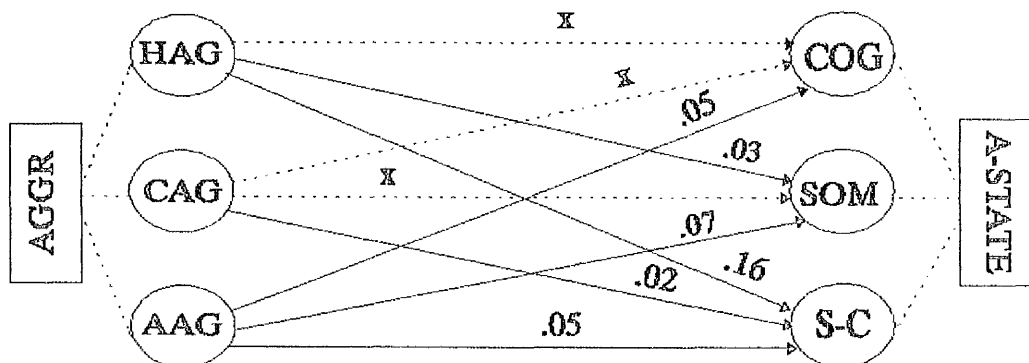


Figure 5.1.6b : Relationship Between the AAI and CSAI-2 Measures for Females.

b) PREDICTING COMPETITIVE A-STATE FROM ATHLETIC TYPES OF AGGRESSION

Regression analyses were conducted between the athletic types of aggression as the independent variables and components of competitive A-state as the dependent ones. Results regarding the relationship between honest aggression and competitive A-state indicated that honest aggression was a significant predictor of self-confidence for all sport categories (Fig. 5.1.4b to 5.1.10b) but a very weak predictor of A-cognitive and A-somatic for some categories or no significant at all

CONTACT - S

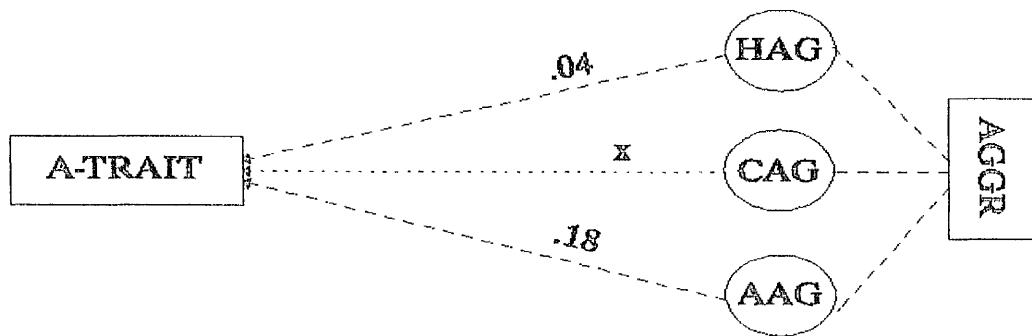


Figure 5.1.7a : Relationship Between the SCAT and AAI Measures for the Contact Sport Athletes.

CONTACT - S

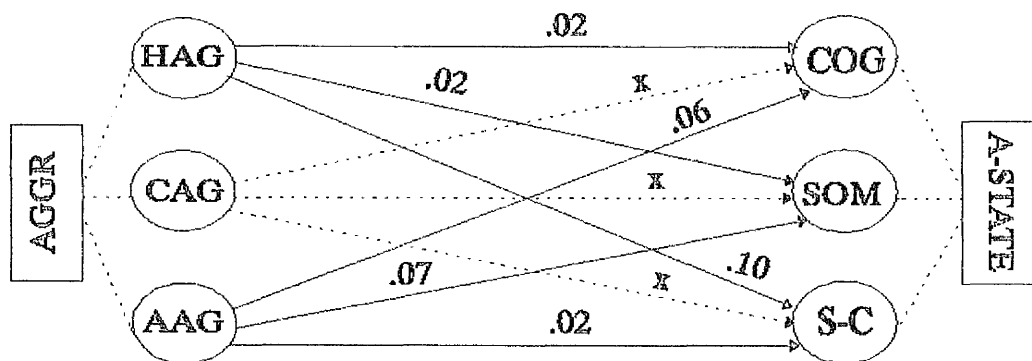


Figure 5.1.7b : Relationship Between the AAI and CSAI-2 Measures for the Contact Sport Athletes.

for some others.

Cynical aggression on the other hand was not a significant predictor of A-state for all except for male (A-somatic) (Fig. 5.1.5b) and female athletes category (self-confidence) (Fig. 5.1.6b).

Among the types of aggression, angry aggression was the most significant predictor of athletes competitive A-state. Moreover, angry aggression revealed a stronger effect for both A-cognitive and A-somatic than for self-confidence. These results were consistent across

#### NON-CONTACT - S

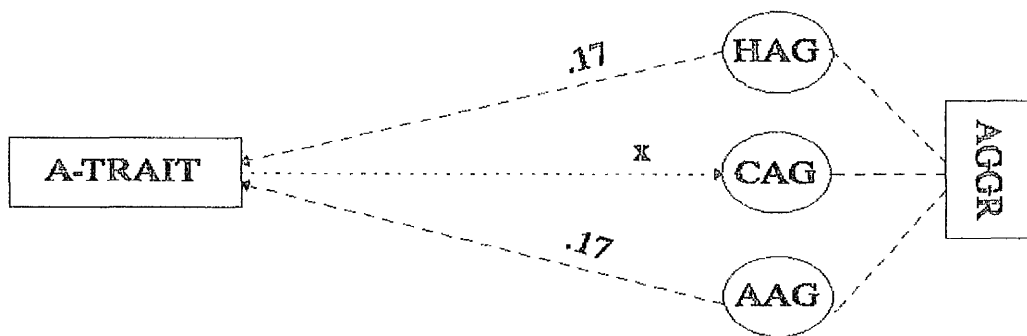


Figure 5.1.8a : Relationship Between the SCAT and AAI Measures for the Non-Contact Sport Athletes.

#### NON-CONTACT - S

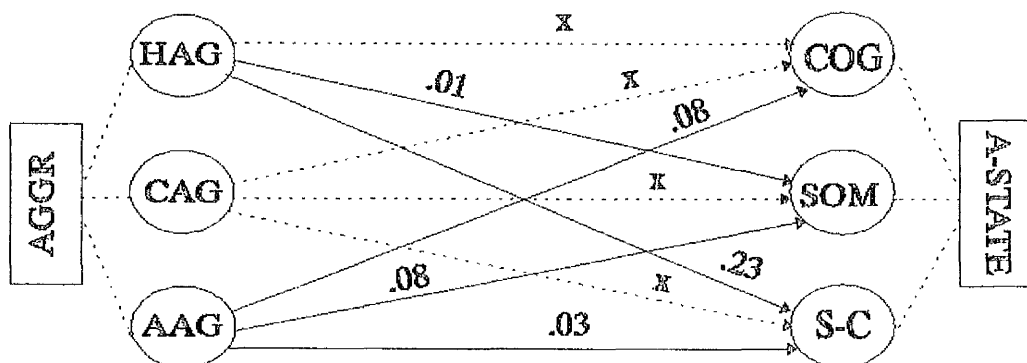


Figure 5.1.8b : Relationship Between the AAI and CSAI-2 Measures for the Non-Contact Sport Athletes.

all categories (Fig. 5.1.4b to 5.1.10b).

In summary, the significant effects revealed with regard to the above constructs are as follows:

Honest Aggression with A-Cognitive : Significant but very weak effects (2%) or none.

Honest Aggression with A-Somatic : Significant but very weak effects (3%) or none.

Honest Aggression with Self-Confidence : The strongest effect was

**TEAM - S**

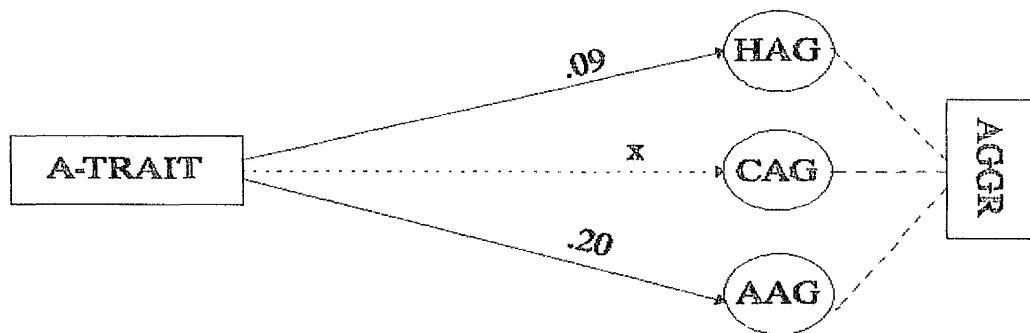


Figure 5.1.9a : Relationship Between the SCAT and AAI Measures for the Team Sport Athletes.

**TEAM - S**

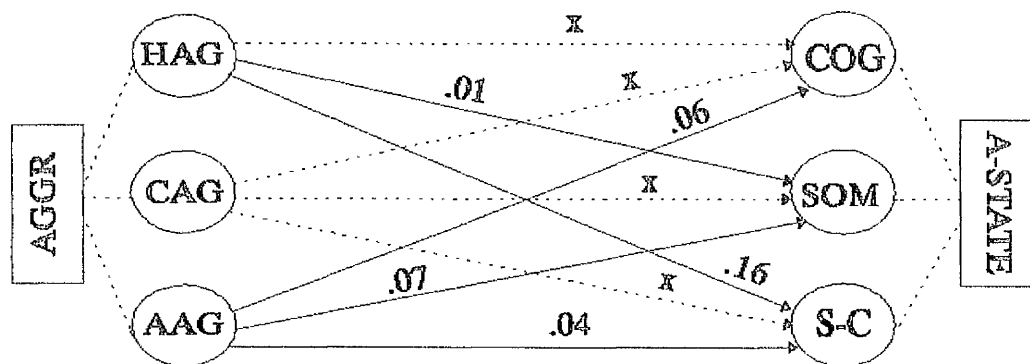


Figure 5.1.9b : Relationship Between the AAI and CSAI-2 Measures for the Team Sport Athletes.

revealed for non-contact athletes accounting for 23% of variance (Fig. 5.1.8b) and the weakest effect for contact sport athletes (10%) (Fig. 5.1.7b).

Cynical Aggression with Components of A-State : The majority of the effects were non-significant or very weak (2%).

Angry Aggression with A-Cognitive : The strongest effect accounted for 9% of variance for individual sport athletes (Fig. 5.1.10b) and the weakest for females (5%) (Fig. 5.1.6b)

#### INDIVIDUAL - S

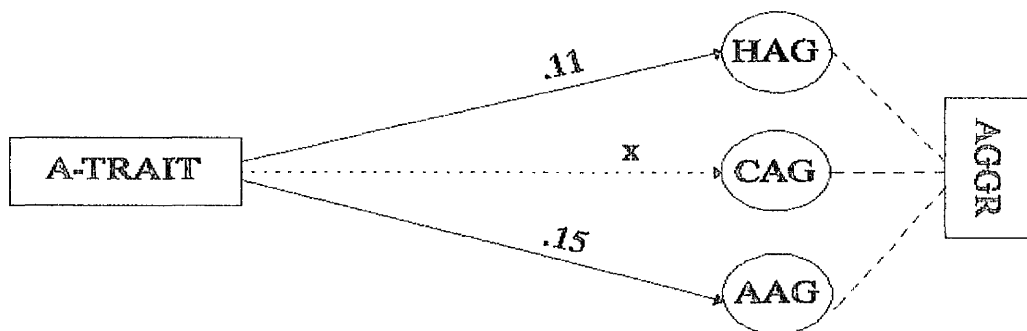


Figure 5.1.10a : Relationship Between the SCAT and AAI Measures for the Individual Sport Athletes.

#### INDIVIDUAL - S

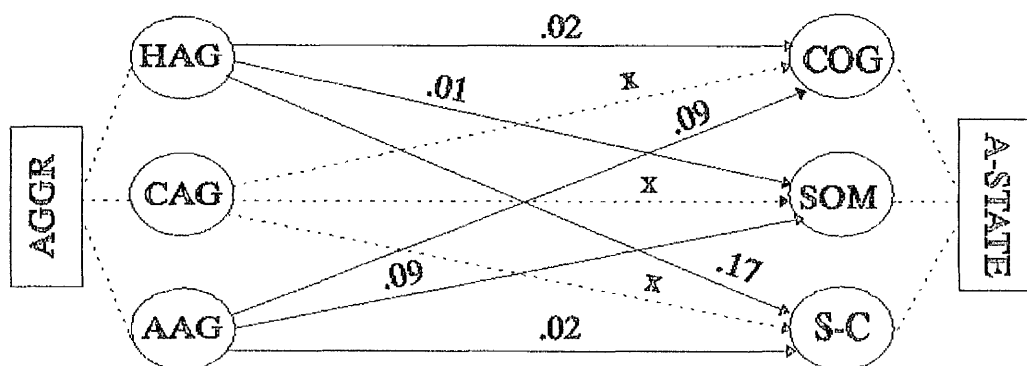


Figure 5.1.10b : Relationship Between the AAI and CSAI-2 Measures for the Individual Sport Athletes.

Angry Aggression with A-Somatic : The strongest effect revealed for individual athletes (9%) (Fig. 5.1.10b) and the weakest (7%) for contact (Fig. 5.1.7b), team (Fig. 5.1.9b), and female categories (Fig. 5.1.6b).

Angry Aggression with Self-Confidence : Significant weak effect for all categories (5% to 2%).

#### PHASE 2: PREDICTING AGGRESSION FROM COMPETITIVE ANXIETY AND VICE VERSA USING LOW, MEDIUM, AND HIGH SCORERS' GROUPS

One of the purposes of this study was to find out whether athletes low or high in aggression of a particular type exhibited competitive A-trait and/ or competitive A-state of the same intensity or otherwise. In order to obtain meaningful results, the variables of the types of athletic aggression, competitive A-trait, and components of competitive A-state were collapsed into three groups. Specifically, athletes of each (sport) category were assigned to low, medium and high scorers' groups according to their score on the variable of interest. The borders of these groups were defined by using the method of extreme groups. According to this method, upper and lower criterion groups are selected from the extremes of the distribution.

The question however was at which point of the continuous scale cut-offs should be imposed so that the reliability of the results is not reduced because of the small number of cases utilized in contrasted groups. As Cureton (1957b; in Anastasi, 1990) has pointed out, when the kurtosis of a variable is not zero, then, the optimum percentage is slightly greater than 27 and approaches 33. Therefore, any convenient number between 27% and 33% will serve satisfactorily. In this study, the optimum point at which the balance of the above conditions seemed

to be reached was the upper and lower 30%. Thus, the borders of the three groups were defined as follows: low = equal or less than 30%; medium = 31% to 69%; high = equal or higher than 70%.

Separate regression analyses were initially considered within each combination of low, medium and high values for all pairs of variables. Results were poor due to the small number of cases in certain combinations, and violations of the underlying assumptions of normality and linearity in others. Breaking the main regression line into nine sections was not felt to be valid statistically due to breakdown of the fundamental assumption of independent observations. Thus, it was decided to abandon this approach and the methods of regression plots and crosstabs were adopted instead. The two approaches will be described below, followed by a comparison of results obtained by the two methods.

### PHASE 3: REGRESSION PLOTS

A scatterplot provides a means for revealing various types of association between two variables. If the observed points cluster more or less around a straight line the relationship between the variables is considered to be linear. Since the observed data points do not fall on a straight line but cluster around it, many lines can be drawn through the data points. The method of least squares results in a line that minimizes the sum of squared vertical distances from the observed data points to the line (Norusis, 1990).

From the plot procedure of SPSS regression, statistics regarding the values of slope and intercept are produced among others. *Intercept* is the point at which the line hits the vertical (Y) axis while the

## Chapter 5: Study III Aggression & Anxiety

*slope* provides information about how much increase or decrease there is in a variable's value. Positive value of the slope indicates that if a variable increases, so does the other variable, while negative value indicates that as one variable increases the other decreases. A small slope on the other hand means that there is a gradual increase or decrease, while if the slope is zero it means that changes in the x variable have no linear effect on the y variable (Norusis, 1991).

The same low, medium and high scores' groups were employed again for assessing the general trends regarding the relationship between variables. With the assistance of both least squares line and regression statistics provided on the one hand, and the (dotted) lines drawn on scatterplots where the borders of groups were defined on the other, it was possible to estimate to some extent the predictive ability of variables.

An example of such a scatterplot for male athletes with the least squares line superimposed on is presented in Figure 5.3.11, with competitive A-trait as the independent variable (X axis) and angry aggression as the dependent variable (Y axis).

From this plot there appears to be a negative association between the two variables. This means that as the competitive trait anxiety increases, angry aggression gradually decreases. For example, "high" A-trait, above 22 in range, is predicted to range values of the angry aggression, below 25, some of which are "medium" but most of which are "low."

The regression plots procedure was employed for all pairs of variables. The general trends revealed in these results will be described briefly.



## PLOT OF AAG WITH A-TRAIT

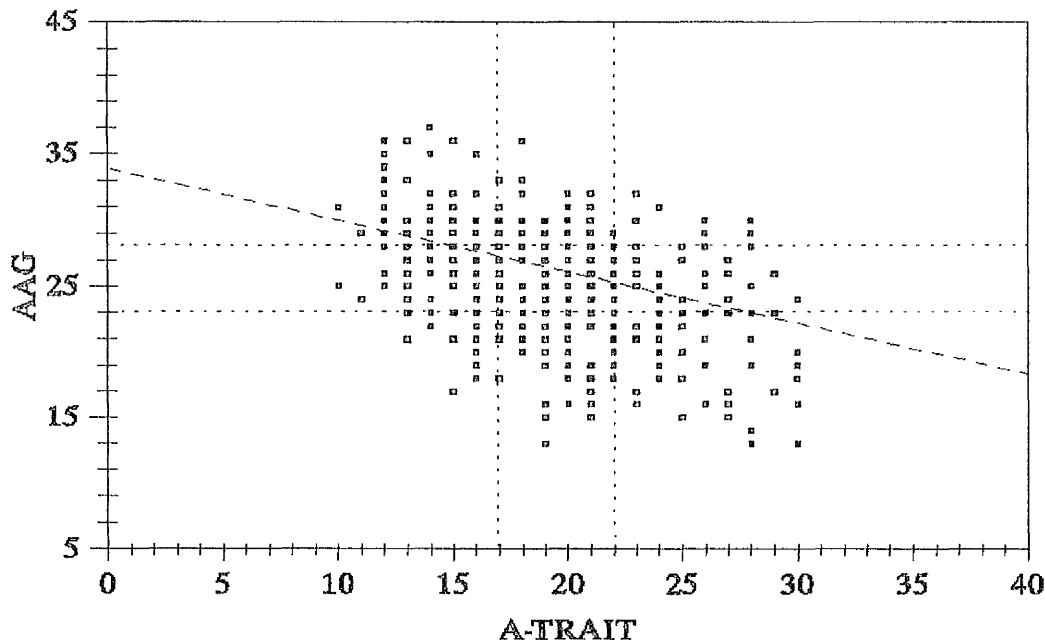


Figure 5.3.11 : Regression Plot for the Male Athletes Category with the Competitive A-Trait (IV) and the Angry Aggression Type (AAG) (DV).

### a) COMPETITIVE A-TRAIT WITH ATHLETIC TYPES OF AGGRESSION

Pairs of variables between competitive A-trait and aggression types which appeared to have a non-significant relationship (slope value close to zero and 2-tailed test not significant) are presented in Appendix 19 (Table A.19.1). Results regarding the significant relationships are as follows:

Competitive A-Trait with Honest Aggression : The association between competitive A-trait and honest aggression was positive for all categories (Table 5.3.2). The value of slope for non-contact sport athletes was larger comparatively (slope (S.E.) = .492) than for the other categories, indicating stronger relationship between the two variables. It could also mean that small changes in athletes'

Table 5.3.2 : Predicting the Honest Type of Aggression from the Competitive A-Trait and/or Vice Versa

| Predicted/or Variable | Category    | Competitive A-Trait |        |        |      |
|-----------------------|-------------|---------------------|--------|--------|------|
|                       |             | Slope               | Interc | Correl | Sig. |
| Honest Aggression     | All         | .272                | 12.87  | .325   | .000 |
|                       | Males       | .216                | 13.67  | .252   | .000 |
|                       | Females     | .316                | 12.43  | .386   | .000 |
|                       | Contact     | .246                | 15.61  | .199   | .000 |
|                       | Non-Contact | .492                | 10.94  | .419   | .000 |
|                       | Team        | .252                | 13.24  | .301   | .000 |
|                       | Individual  | .292                | 12.47  | .342   | .000 |

competitive trait anxiety would lead to a large change in their honest aggression levels. Results showed that as competitive A-trait increased, athletes' score of honest aggression increased too (we should bear in mind that a low score indicates high level of honest aggression, therefore athletes tended to become lower in honest aggression). However, in terms of prediction with regard to the three groups, it could be said that the independent variable (either competitive A-trait or honest aggression) was not a strong predictor as it usually predicted values of the dependent variable laying in the medium range.

Competitive A-Trait with Angry Aggression : The association between competitive A-trait and angry aggression was negative for all categories indicating that as athletes' trait anxiety increased, their angry aggression score decreased, therefore, the higher in competitive A-trait athletes were, the more angry aggressive they tended to be (because, high score on angry aggression factor indicates low level of this type of aggression whereas a low score indicates a high level of angry aggression) (see Fig. 5.3.11, and Table 5.3.3).

The slope for all but non-contact sport categories was larger

Table 5.3.3 : Predicting the Angry Type of Aggression from the Competitive A-Trait and/or Vice Versa

| Predicted/or<br>Variable | Category     | Competitive A-Trait |        |        |      |
|--------------------------|--------------|---------------------|--------|--------|------|
|                          |              | Slope               | Interc | Correl | Sig. |
| Angry Aggression         | All          | -.417               | 33.76  | -.417  | .000 |
|                          | Males        | -.463               | 34.54  | -.438  | .000 |
|                          | Females      | -.398               | 31.36  | -.380  | .000 |
|                          | Contact      | -.404               | 30.12  | -.424  | .000 |
|                          | Non- Contact | -.441               | 31.60  | -.419  | .000 |
|                          | Team         | -.443               | 34.04  | -.448  | .000 |
|                          | Individual   | -.405               | 33.78  | -.393  | .000 |

than those obtained for honest aggression, indicating a stronger relationship between the competitive A-trait and angry aggression. However, the wide range of values of the independent variable predicted a relatively narrow range of values of the dependent variable.

**Competitive A-Trait with Cynical Aggression :** In so far the association between competitive A-trait and cynical aggression is concerned, results were significant only for male and female athletes. What was quite interesting about these results is the direction of the slope. The slope value for males was negative while for females was positive (Table 5.3.4). In other words, male athletes cynical aggression tended to increase as they became higher in competitive A-trait, whereas female athletes tended to become less cynical as competitive A-trait increased. However, the slope was rather a small one for both

Table 5.3.4 : Predicting the Cynical Type of Aggression from the Competitive A-Trait and / or Vice Versa

| Predicted / or<br>Variable | Category | Competitive A-Trait |        |        |      |
|----------------------------|----------|---------------------|--------|--------|------|
|                            |          | Slope               | Interc | Correl | Sig. |
| Cynical Aggression         | Males    | -.232               | 39.21  | -.155  | .002 |
|                            | Females  | .242                | 31.48  | .178   | .009 |

categories, indicating that competitive A-trait was a poor predictor of cynical aggression.

b) **ATHLETIC TYPES OF AGGRESSION WITH COMPETITIVE A-STATE**

The non-significant relationships regarding the athletic aggression types with the competitive A-state are shown in Appendix 19 (Table A.19.2). For the remaining pairs of variables, a closer examination of the scatterplots disclosed the existence of the following significant relationships:

**A-Cognitive with Honest Aggression :** Only for three categories, that is total sample (All), contact and individual sport athletes found that a significant positive association existed between these two variables (Table 5.3.5). However, the regression line was not steep enough to capture the relationship across groups (low, medium, high) though this tendency was more obvious for contact sport athletes. Thus, it appeared that prediction could be made mainly with regard to medium scores' group. For those athletes there was a gradual decrease in their honest aggression (high score) as their A-cognitive increased.

**A-Somatic with Honest Aggression :** With the exception of male athletes, for all other categories the association of two variables appeared to be significant and positive (Table 5.3.5). Results were similar to those reported above for A-cognitive, regarding prediction at the three levels. In other words, it seemed that higher levels of A-somatic were associated with low levels (high score) of honest aggression.

**Self-Confidence with Honest Aggression :** Results regarding this relationship showed that all slope values were negative and for some categories (e.g. non-contact sport athletes) the regression line was

**Table 5.3.5 : Predicting Competitive A-State from Honest Aggression**

| Predicted Var   | Category    | Honest Aggression |        |        |      |
|-----------------|-------------|-------------------|--------|--------|------|
|                 |             | Slope             | Interc | Correl | Sig  |
| A-Cognitive     | All         | .133              | 13.34  | .110   | .007 |
|                 | Contact     | .235              | 11.78  | .165   | .003 |
|                 | Individual  | .176              | 12.76  | .149   | .013 |
| A-Somatic       | All         | .167              | 13.74  | .131   | .001 |
|                 | Females     | .235              | 12.93  | .185   | .007 |
|                 | Contact     | .212              | 13.24  | .153   | .006 |
|                 | Non-Contact | .150              | 13.73  | .124   | .034 |
|                 | Team        | .152              | 13.10  | .120   | .029 |
|                 | Individual  | .158              | 15.01  | .127   | .035 |
| Self-Confidence | Total       | -.452             | 29.84  | -.410  | .000 |
|                 | Males       | -.422             | 29.62  | -.386  | .000 |
|                 | Females     | -.455             | 29.32  | -.407  | .000 |
|                 | Contact     | -.391             | 28.79  | -.323  | .000 |
|                 | Non-Contact | -.493             | 30.56  | -.481  | .000 |
|                 | Team        | -.429             | 30.27  | -.407  | .000 |
|                 | Individual  | -.452             | 28.82  | -.415  | .000 |

quite steep (Table 5.3.5). Examination of plots revealed that for all categories prediction could be made for the entire sample (across the three groups) suggesting that, as athletes level of honest aggression decreased (high score on this factor), their self-confidence level decreased too.

**A-Cognitive with Cynical Aggression :** It was found that the category of male athletes was the only one which showed a significant negative association for this pair of variables (Table 5.3.6). Results were quite similar to those reported above for competitive A-trait with cynical aggression indicating that increases in A-cognitive are accompanied by a gradual increase of cynical aggression.

**A-Somatic with Cynical Aggression :** Exactly the same results (as for the A-Cognitive with CAG) found for this pair of variables, suggesting that increases in cynical aggression (low score on this factor) are accompanied by the elevation of A-somatic (Table 5.3.6).

**Table 5.3.6 : Predicting Competitive A-State from Cynical Aggression**

| Predicted Var   | Category | Cynical Aggression |        |        |      |
|-----------------|----------|--------------------|--------|--------|------|
|                 |          | Slope              | Interc | Correl | Sig  |
| A-Cognitive     | Males    | -.100              | 18.97  | -.136  | .006 |
| A-Somatic       | Males    | -.111              | 20.35  | -.149  | .003 |
| Self-Confidence | Females  | -.094              | 24.04  | -.140  | .041 |

**Self-Confidence with Cynical Aggression :** Self-confidence was negatively associated with cynical aggression only with regard to female athletes (Table 5.3.6). This means that, higher levels of self-confidence were associated with higher levels of cynical aggression (low score on cynical aggression factor). No other associations for any category were found to be significant.

An interesting observation that is concerned with the association of cynical aggression with the competitive A-State can be made here. The two constructs appeared to be associated mainly with the factor gender rather than with any other category. However, this issue will be discussed more extensively in the discussion chapter.

**A-Cognitive with Angry Aggression :** Results regarding this relationship were significant across all categories (Table 5.3.7). The value of slope was negative for all of them and larger than that of cynical aggression allowing to some degree prediction especially for the medium and high scores' groups. Thus, it appeared that there was a gradual increase in athletes' cognitive anxiety as they became higher in angry aggression (low score).

**A-Somatic with Angry Aggression :** The same trends appeared with regard to A-somatic and angry aggression association (Table 5.3.7). Slope value was again negative for all categories suggesting that, with no

exception for any category, A-somatic was elevated as athletes angry aggression increased.

**Self-Confidence with Angry Aggression :** With regard to this pair of variables, results revealed the existence of a significant relationship across all categories, with the slope value positively signed (Table 5.3.7). According to these results, it can be concluded that the more angry aggressive the athletes were, the lower their level of self-confidence tended to become.

**Table 5.3.7 : Predicting Competitive A-State from Angry Aggression**

| Predicted Var   | Category    | Angry Aggression |        |        |      |
|-----------------|-------------|------------------|--------|--------|------|
|                 |             | Slope            | Interc | Correl | Sig  |
| A-Cognitive     | All         | -.276            | 22.81  | -.271  | .000 |
|                 | Males       | -.293            | 22.98  | -.283  | .000 |
|                 | Females     | -.233            | 22.20  | -.239  | .000 |
|                 | Contact     | -.272            | 22.79  | -.249  | .000 |
|                 | Non-Contact | -.277            | 22.71  | -.291  | .000 |
|                 | Team        | -.260            | 22.20  | -.247  | .000 |
|                 | Individual  | -.291            | 23.42  | -.298  | .000 |
| A-Somatic       | All         | -.301            | 24.47  | -.281  | .000 |
|                 | Males       | -.297            | 24.07  | -.282  | .000 |
|                 | Females     | -.297            | 24.90  | -.272  | .000 |
|                 | Contact     | -.293            | 24.36  | -.274  | .000 |
|                 | Non-Contact | -.305            | 24.44  | -.282  | .000 |
|                 | Team        | -.293            | 23.32  | -.273  | .000 |
|                 | Individual  | -.306            | 25.71  | -.299  | .000 |
| Self-Confidence | All         | .157             | 17.55  | .170   | .000 |
|                 | Males       | .110             | 19.25  | .124   | .014 |
|                 | Females     | .226             | 14.89  | .236   | .000 |
|                 | Contact     | .150             | 18.01  | .161   | .004 |
|                 | Non-Contact | .175             | 16.75  | .191   | .001 |
|                 | Team        | .177             | 17.97  | .198   | .000 |
|                 | Individual  | .134             | 17.02  | .149   | .014 |

Overall, results indicated that, prediction was mainly confined to medium scorers' groups; therefore, prediction across the low, medium and high scorers' groups could be made to a relatively few pairs of variables.

PHASE 4: CROSSTABULATION RESULTS

In this subsection, the results of crosstabulations performed to further explore the strength and nature of the relationships between aggression types and competitive anxiety at the low, medium, and high levels will be presented. Variables were defined as independent or dependent in the same way as for the previous analyses.

A number of statistics are produced in the CROSSTABS procedure in SPSS which measure a variety of degrees of association between two variables. However, the main advantage of using CROSSTABS in this study is that, the three groups of low, medium, and high scorers of both variables can be assessed in a simple analysis. But, it should be noted that, relationships can be examined only between grouped values: information in the original raw variables is lost on grouping. Precise results will be of course depend on the criteria for low, medium and high, but, as explained earlier in the phase 2 of the study III, the use of the 30th and 70th percentiles was not felt to affect the general conclusions. Before the results of these analyses are presented, the CROSSTABS table will be described first as a brief introduction to crosstabulation.

Different types of information are provided through the row, column and table percentages by the crosstabs table. The choice for the percentages used depends on the nature of the two variables (independent or dependent).

Figure 5.4.12 shows a crosstabulation of honest aggression with competitive A-trait for individual sport athletes. For this category, competitive A-trait was the independent variable and honest aggression the dependent one. Since the independent variable is the column



Figure 5.4.12 : Crosstabulation of Honest Aggression and Competitive A-Trait for Individual Sport Category

|                 |         | A-TRAIT<br>(IV) |       |       | Row<br>Total |
|-----------------|---------|-----------------|-------|-------|--------------|
| Count           | Exp Val | 1.00            | 2.00  | 3.00  |              |
| Row Pct         | Col Pct |                 |       |       |              |
| Residual        |         |                 |       |       |              |
| HONEST          | 1.00    | 42              | 39    | 14    | 95           |
| AGGR            |         | 29.2            | 37.0  | 28.8  | 32.8%        |
| (DV)            |         | 44.2%           | 41.1% | 14.7% |              |
|                 |         | 47.2%           | 34.5% | 15.9% |              |
|                 |         | 12.8            | 2.0   | -14.8 |              |
|                 | 2.00    | 24              | 45    | 25    | 94           |
|                 |         | 28.8            | 36.6  | 28.5  | 32.4%        |
|                 |         | 25.5%           | 47.9% | 26.6% |              |
|                 |         | 27.0%           | 39.8% | 28.4% |              |
|                 |         | -4.8            | 8.4   | -3.5  |              |
|                 | 3.00    | 23              | 29    | 49    | 101          |
|                 |         | 31.0            | 39.4  | 30.6  | 34.8%        |
|                 |         | 22.8%           | 28.7% | 48.5% |              |
|                 |         | 25.8%           | 25.7% | 55.7% |              |
|                 |         | -8.0            | -10.4 | 18.4  |              |
| Column<br>Total |         | 89              | 113   | 88    | 290          |
|                 |         | 30.7%           | 39.0% | 30.3% | 100.0%       |

| <u>Chi-Square</u> | <u>Value</u> | <u>DF</u> | <u>Significance</u> |
|-------------------|--------------|-----------|---------------------|
| Pearson           | 32.33220     | 4         | .00000              |
| Mantel-Haenszel   | 24.32609     | 1         | .00000              |

Minimum Expected Frequency - 28.524

**Lambda :**

|              |        |        |         |
|--------------|--------|--------|---------|
| symmetric    | .15847 | .05403 | 2.80223 |
| with HAG DV  | .18519 | .05631 | 3.01482 |
| with SCAT DV | .12994 | .06645 | 1.83457 |

Number of missing observations: 0

variable, column percentages should be selected for interpretation of information. Residuals are the differences between the observed count and the expected count under the null hypothesis of no relationships

between the two variables.

At a first glance, it can be seen by this figure that, most of the residuals are far from zero, suggesting the existence of a positive relationship between the two variables. This is confirmed by the value of the Pearson chi-square statistic that is large enough to account for an observed significant level less than 0.001.

The Mantel-Haenszel statistic tests whether there is a linear association between the two (ordinally grouped) variables. The statistic is significant at the 0.1 percent level, suggesting strong evidence of a linear relationship.

According to this figure, 47.2% of athletes of the low competitive A-trait group corresponded to low scorers (actually high) in honest aggression, and 55.7% of athletes of the high competitive A-trait group corresponded to high scores (thus, low) in honest aggression. In other words, athletes tended to become lower in honest aggression as the competitive A-trait increased.

To predict honest aggression from competitive A-trait, the (independent) A-trait values are considered separately. An athlete with a low value for A-trait is predicted to belong to the honest aggression category with the highest count, with A-trait = 1, i.e. honest aggression = 1 (low). Similarly, an athlete with A-trait = 2 (medium) is predicted to have honest aggression = 2 (medium), and an athlete with A-trait = 3 (high) is predicted to have honest aggression = 3 (high).

a) CROSSTABULATION OF COMPETITIVE A-TRAIT AND ATHLETIC TYPES OF AGGRESSION

The significant relationships concerned with the competitive A-

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trait and athletic aggression types as they were revealed through crosstabulations are presented in Table 5.4.8.

**Competitive A-Trait and Honest Aggression :** For four categories, that is the total sample, males, non-contact and individual sport, a clear positive relationship was revealed. For low competitive A-trait, low score (actually high) of honest aggression was predicted, for medium A-

**Table 5.4.8 : Chi-square Test for the Competitive A-Trait and the Athletic Aggression Types**

| Pair of variabl  | Sport categ | Pearson Chi-sq value<br>DF = 4 | Sig Pear | Mantel-Haenszel value* <sup>2</sup><br>DF = 1 | Sig M-H | Lambda |
|------------------|-------------|--------------------------------|----------|---|---------|--------|
| A-TRAIT with HAG | Total       | 51.34                          | .000     | 48.49   | .000    | .13953 |
|                  | Males       | 21.20                          | .000     | 19.93   | .000    | .10800 |
|                  | Females     | 24.45                          | .000     | 22.89   | .000    | .19380 |
|                  | Cont-S      | 16.88                          | .002     | 11.16   | .000    | .12255 |
|                  | N-Cont      | 44.27                          | .000     | 40.01   | .000    | .21429 |
|                  | Team-S      | 20.27                          | .000     | 18.90   | .000    | .13659 |
|                  | Ind-S       | 32.33                          | .000     | 24.33   | .000    | .18519 |
| A-TRAIT with CAG | Males       | 10.14                          | .038     | 8.28  | .004    | .06048 |
|                  | Females     | 12.17                          | .016     | 7.06  | .007    | .09701 |
| A-TRAIT with AAG | Total       | 67.51                          | .000     | 64.59   | .000    | .17812 |
|                  | Males       | 56.81                          | .000     | 54.84   | .000    | .18548 |
|                  | Females     | 24.73                          | .000     | 20.24   | .000    | .18657 |
|                  | Cont-S      | 40.01                          | .000     | 39.28   | .000    | .17157 |
|                  | N-Cont      | 40.56                          | .000     | 36.67   | .000    | .17347 |
|                  | Team-S      | 46.31                          | .000     | 44.73   | .000    | .15238 |
|                  | Ind-S       | 31.72                          | .000     | 31.16   | .000    | .17204 |

<sup>2</sup>Mantel - Haenszel chi-square is square of Pearson correlation coefficient multiplied by number of cases minus 1.

trait medium level of honest aggression was predicted and for high competitive A-trait high (actually low) level of honest aggression was predicted. For the rest of the categories, the relationship between variables was not so clear, in the sense that, low (actually high) honest aggression score predicted by both low and medium A-trait in one condition and high (actually low) honest aggression score by medium and high competitive A-trait in another (e.g. female category).

Competitive A-Trait and Cynical Aggression : With regard to this pair of variables, significant relationships were found only for male and female athletes separately. The categories with no significant relationship between the two variables are shown in Appendix 20, Table A.20.8. In terms of direction, the relationship was negative and less clear for males but positive and more well-defined for females. These results are in accord with results of regression plots.

Competitive A-Trait and Angry Aggression : Results indicated that there was a significant negative relationship between the two variables across categories. Competitive A-trait and angry aggression were clearly related for females, contact and non-contact athletes. For these categories, given low competitive trait anxiety high (actually lower level) angry aggression could be predicted. With regard to the remaining categories, similar trends were evident.

b) CROSSTABULATION OF ATHLETIC TYPES OF AGGRESSION AND COMPETITIVE A-STATE

The nonsignificant relationships found concerning athletes' aggression (honest, cynical, angry) and competitive A-state (A-cognitive, A-somatic, self-confidence) are presented in Appendix 20 (Table A.20.9). Following, the significant relationships (Table 5.4.9)

will be described.

A-Cognitive and Honest Aggression : Only for two categories, namely, total sample and contact sport, A-cognitive and honest aggression appeared to be positively related to each other. For both categories, low honest scorers (actually high level) group corresponded to low A-cognitive athletes, while medium and high honest (actually low level) aggression groups corresponded to the high A-cognitive group (Table 5.4.9).

A-Somatic and Honest Aggression : Significant positive relationships were found for total sample and contact sport athletes (Table 5.4.9).

Self-Confidence and Honest Aggression : It was found that honest aggression was significantly related to self-confidence for all

**Table 5.4.9 : Chi-Square Test for the Honest Aggression and the Competitive A-State**

| Pair of variables | Category | Pearson Chi-sq value<br>DF = 4 | Sig Pear | Mantel-Haenszel value<br>DF = 1 | Sig M-H | Lambda |
|-------------------|----------|--------------------------------|----------|---------------------------------|---------|--------|
| A-COG with HAG    | Total S  | 12.22                          | .016     | 10.59                           | .001    | .04749 |
|                   | Cont-S   | 14.45                          | .006     | 10.96                           | .000    | .10345 |
| A-SOMAT with HAG  | Total S  | 12.66                          | .013     | 11.79                           | .000    | .06410 |
|                   | Cont-S   | 9.68                           | .046     | 9.16                            | .002    | .08955 |
| SELF-C with HAG   | Total S  | 78.99                          | .000     | 75.35                           | .000    | .16402 |
|                   | Males    | 65.56                          | .000     | 61.39                           | .000    | .22490 |
|                   | Females  | 26.84                          | .000     | 22.49                           | .000    | .14286 |
|                   | Cont-S   | 41.26                          | .000     | 40.19                           | .000    | .19000 |
|                   | N-Cont   | 45.97                          | .000     | 41.39                           | .000    | .10689 |
|                   | Team-S   | 36.54                          | .000     | 34.77                           | .000    | .18878 |
|                   | Ind-S    | 42.75                          | .000     | 36.68                           | .000    | .17222 |

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categories (negative direction) (Table 5.4.9). For most of the categories the relationship of the two variables was quite distinct across groups indicating that, athletes of low (high level in honest aggression), medium, and high (low level in honest aggression) honest aggression groups corresponded to high, medium and low self-confidence groups respectively. It should also be noted that, no clear pattern of relationship could be established for females, while for contact and team sport category the low and upper scorers groups were favoured in terms of prediction.

A-Cognitive and Cynical Aggression : Only a significant (negative) relationship was found with regard to male athletes (Table 5.4.10). Prediction was confounded to low and medium scorer groups. These results were similar to those found in regression plots.

**Table 5.4.10 : Chi-square Test for the Cynical Aggression and the Competitive A-State**

| Pair of variabl | Sport categ | Pearson Chi-sq value<br>DF = 4 | Sig Pear | Mantel-Haenszel value<br>DF = 1 | Sig M-H | Lambda |
|-----------------|-------------|--------------------------------|----------|---------------------------------|---------|--------|
| CAG - A-COG     | Males       | 14.19                          | .006     | 8.71                            | .003    | .03863 |
| CAG - A-SOM     | Males       | 13.66                          | .008     | 9.09                            | .002    | .05714 |

A-Somatic and Cynical Aggression : Competitive somatic anxiety and cynical aggression were found to be related only for male athletes but no clear direction-relationship could be established for these variables.

Self-Confidence and Cynical Aggression : No significant relationship was found for any category with regard to this pair of variables.

Table 5.4.11 presents the significant relationships for angry

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aggression and competitive A-state. Results concerning these pairs of variables are discussed below.

A-Cognitive and Angry Aggression : Results regarding these two constructs appeared to be mixed. In other words, there was no degree of consistency (except for the negative direction) in whether low, medium, and high A-cognitive groups would be better predicted from low, or medium, or high angry aggression groups. The only exception was the individual sport category, which showed clear relationship across groups.

**Table 5.4.11 : Chi-square Test for the Angry Aggression and the Competitive A-State**

| Pair of<br>variabl    | Sport<br>categ | Pearson<br>Chi-sq<br>value<br>DF = 4 | Sig<br>Pear | Mantel-<br>Haenszel<br>value<br>DF = 1 | Sig<br>M-H | Lambda |
|-----------------------|----------------|--------------------------------------|-------------|--|------------|--------|
| AAG<br>with<br>A-COG  | Total          | 34.33                                | .000        | 28.57                                  | .000       | .10554 |
|                       | Males          | 27.73                                | .000        | 20.27                                  | .000       | .06867 |
|                       | N-Cont         | 37.27                                | .000        | 26.70                                  | .000       | .17368 |
|                       | Team-S         | 12.81                                | .012        | 12.25                                  | .000       | .06091 |
|                       | Ind-S          | 24.42                                | .000        | 16.52                                  | .000       | .11290 |
| AAG<br>with<br>A-SOM  | Total          | 33.43                                | .000        | 33.20                                  | .000       | .10513 |
|                       | Males          | 26.02                                | .000        | 24.87                                  | .000       | .10204 |
|                       | Cont-S         | 12.52                                | .013        | 11.83                                  | .000       | .10945 |
|                       | N-Cont         | 33.77                                | .000        | 26.20                                  | .000       | .18041 |
|                       | Team-S         | 13.77                                | .008        | 13.17                                  | .000       | .05851 |
|                       | Ind-S          | 20.61                                | .000        | 13.07                                  | .000       | .13587 |
| AAG<br>with<br>SELF-C | Total          | 15.08                                | .004        | 13.02                                  | .000       | .04497 |
|                       | Females        | 13.27                                | .010        | 11.74                                  | .000       | .10526 |
|                       | N-Cont         | 21.23                                | .000        | 18.24                                  | .000       | .11399 |
|                       | Team-S         | 11.41                                | .022        | 7.60                                   | .005       | .07653 |
|                       | Ind-S          | 11.36                                | .022        | 8.41                                   | .003       | .06111 |

A-Somatic and Angry Aggression : Significant negative relationships found for all but female athletes category (Table 5.4.11). In terms of prediction, for total sample and male athletes the relationship was clearly defined between the two variables across the three groups. For the other categories, the low and high pairs of scorers groups were equally favoured but not the medium scorers groups. According to these results, high scorers (less aggressive) in angry aggression exhibited low levels of somatic anxiety whereas low scorers (more angry aggressive) exhibited a more intense physiological A-state.

Self-Confidence and Angry Aggression : All the significant results found indicated distinct positive relationships across groups with the exception of team sport category. These results clearly suggest that as athletes' angry aggression increased (i.e. the actual level of angry aggression decreased) their self-confidence level increased too.

If the results obtained through the methods used for examining the relationships under investigation were compared, it could be argued that they were consistent, at least in so far the main trends are concerned. The differences observed between regression plots and crosstabs (e.g. with regard to the medium scorers group) were somewhat expected and within the limitations and potential of the methods.

#### PHASE 5: DISCUSSION OF THE RELATIONSHIP BETWEEN ATHLETIC AGGRESSION TYPES AND COMPETITIVE ANXIETY (A-TRAIT, A-STATE)

The results with regard to the relationship between athletic aggression types and competitive anxiety (A-trait and A-state) will be discussed in this section.



a) COMPETITIVE A-TRAIT WITH ATHLETIC TYPES OF AGGRESSION AND VICE  
VERSA

First and foremost, the findings rejected the null hypothesis (2.3.1) supporting the relationship between aggression types and competitive trait anxiety. This relationship appeared to be stronger for some sport categories and weaker for some others.

With regard to Competitive A-Trait with Honest (HAG) Type of Aggression relationship, it was found that the honest type of aggression predicted 17% of the variance (strongest effect) of the competitive A-trait for the non-contact sport athletes followed by the female and individual sport category, and 4% of the variance for the contact sport athletes (weakest effect) followed by male and team sport category. In particular, it was demonstrated that as athletes competitive A-trait increased their honest aggression decreased. This finding can have serious implications for athletes, because among the qualities of honest aggression is the ability for attaining self-control and concentration on the task at hand. Therefore, high levels of competitive A-trait can have negative effect on athletes' concentration as their honest aggression level is lowered. It might be possible then, at that state, for athletes to experience attentional conflict that can shift their concentration from task relevant to task irrelevant cues (Baron et al., 1978).

Furthermore, the weak interrelation between honest aggression and competitive A-trait for contact athletes seemed to suggest that, honest aggression is directly affected by the kind of judgement athletes of this sport category make about the intentions of their opponents. Since the performance of non-contact sport athletes is not directly affected

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by opponents' intentions and actions, the interrelation between honest aggression and competitive A-trait for this category appeared to be much stronger. It might be, therefore, the nature of sport that allows non-contact sport athletes to attain greater control over their internal states and in particular on their thoughts than contact sport athletes may do. For this reason, the later category may need to work more with techniques of self-control and mental training.

Competitive A-Trait with Cynical (CAG) Type of Aggression : With respect to the prediction of competitive A-trait from the cynical type of aggression or vice versa, the results showed that no significant relationships were evident for all but male and female athletes category. These significant relationships appeared to be very weak (.02 and .03 for males and females respectively) but quite interesting because the importance of the factor "gender" is stressed. Specifically, it was found that males' cynical aggression tended to increase as they became higher in competitive A-trait whereas females' cynical aggression tended to decrease as their competitive A-trait increased.

These positive and negative effects may have to do with athletes socialization in general and the way they behave in the competitive situation in particular. As suggested by social psychologists, women receive more punishment for aggression (Leming, 1980), hence, they are more conforming and obedient. Thus, women are expected to be more sensitive to sanction threats than men.

Results obtained from a study conducted by Leming (1980) supported this view, and add to our knowledge in terms of the variation of conditions in which cynical behaviour is likely to be expressed.

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Specifically, Leming found that cheating was situational specific. Subjects in the experimental group cheated more under the low risk condition than under the high risk condition. In addition, when the data was analyzed with respect to the relationship between sex and cheating behaviour, women cheated significantly more than men in the low risk conditions. It would not be surprising therefore, in conditions not perceived as high risk, to find a positive relationship between anxiety and cynical aggression for female athletes. Nevertheless, only a future investigation could confirm this assumption.

It is worth noting also the view expressed by Mischel and Mischel (1976) that, even the knowledge of individuals' moral reasoning would permit prediction no of more than 10 percent of the variance in their moral behaviour. Therefore, if their view is to be taken into account, we should not expect large proportion of variance to be accounted for for this aggression type, especially when competitive anxiety is the predictor (Mikolajczyk, 1993).

Finally, as regard the Competitive A-Trait with Angry (AAG) Type of Aggression relationship, the results seemed to favour competitive trait anxiety as a better predictor of angry aggression for the total sample, males, team and individual sport categories whilst the angry aggression appeared to be a better predictor of competitive A-trait for females, contact and non-contact sport categories (as it was the case for the competitive A-trait with honest aggression relationship). Furthermore, competitive A-trait explained 20% of variance of angry aggression for team athletes, which was the strongest effect, and angry aggression explained 14% of variance of competitive A-trait for

females, which was the weakest effect. Moreover, results showed that athletes tended to be more angry aggressive as they became high in competitive A-trait.

The relationship between anger and anxiety was supported by the findings of Ben-Zur and Zeidner (1988) who examined sex-group differences in anxiety, anger and curiosity as states and traits. As they reported, they found a moderate relationship between trait anger and trait anxiety. Mook, Van der Ploeg and Kleijn (1990) also reported that the results of their study showed substantial correlation between anger and anxiety at the trait level. But, in both studies the relationship between states was stronger.

This relationship could be better understood by employing the Kashani, Deuser and Reid (1991) observation that, "when persons are in a highly anxious state, their behavioural options are limited, which makes aggression a more likely tactic to be employed by the subject..." (p. 221). It also explains why athletes become irritable and/or engage in arguments with others e.g. teammates, under stressful circumstances as can be training practices and/or pre-competitive situations.

The relationship between angry aggression and competitive anxiety is also supported by Izard's (1972) position. He maintained that, all complex emotional processes such as anxiety contain as elements two or more of the fundamental emotions or their components. In particular, Izard proposed that anxiety involves fear and two or more of the fundamental emotions of distress, shame (including shyness and guilt) anger, and the positive emotion of interest-excitement. He also argued that this formulation was implicitly or partially supported by almost all writers in the field. The results of the present study seem to give

empirical support to Izard's (Izard, 1972) position. Across all sport categories the relationship between competitive A-trait and angry aggression was found to be substantial.

b) **ATHLETIC TYPES OF AGGRESSION WITH COMPETITIVE A-STATE**

This is not the first time that an attempt has been made to test the relationship between aggression and state anxiety in the sport context. Wall and Gruber (1985, 1986) who conducted a study with female intercollegiate basketball players reported that scores of instrumental and reactive aggression, as measured by the short form of BAAGI, did not generally covary with scores on the state anxiety, as measured by CSAI, under similar testing conditions. However, their attempt did differ from the present one in some respects regarding the sample and measuring instruments. Thus, empirical support for their finding was not forthcoming from the present study. The detailed findings concerning the relationship between athletic types of aggression with competitive A-state (cognitive anxiety, somatic anxiety, self-confidence) are as follows:

Honest Aggression with Competitive A-State : From the three components of competitive A-state as measured by the Competitive State Anxiety Inventory-2 (CSAI-2), only the self-confidence factor appeared to be substantially influenced by honest aggression. In particular, significant negative effects were revealed across all categories, explaining from 10% of the variance (for contact sport category, weakest effect) to 23% of the variance (for non-contact sport category, strongest effect). These findings suggest that individuals high in honest aggression were also high in the self-confidence factor.

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Moritz et al's. (1996) results on the specific image content of confident athletes are supportive of those of the present study. They found that the sport confident athletes were more likely to cope successfully with challenging situations, giving 100% effort, remaining calm and handling the stress of competition.

Also, Garfield and Bennett's (1984) position is indirectly supportive of the honest aggression with self-confidence relationship. They identified eight mental and physical conditions which athletes described as being characteristic of the feelings they have at the moments they are doing something well. Among these conditions they described were, mentally relaxed, physically relaxed and confident/optimistic. With respect to the later condition, it was defined as "a positive attitude, feelings of self-confidence and optimism, being able to keep poise and feelings of strength and control even during potentially threatening challenges" (p. 126).

The findings concerned with the honest aggression and cognitive anxiety relationship indicated that honest aggression influenced A-cognitive to a very limited extent (only the total sample, contact and individual sport category). Somatic anxiety, on the other hand, appeared to be influenced by honest aggression across all but male category. However, the effects though significant were very weak explaining only 1% or 2% of the variance. In general, these positive significant effects suggest that decreases in honest aggression can lead to increases in cognitive and somatic anxiety.

Cynical Aggression with Competitive A-State : Cynical aggression was found to influence only the cognitive anxiety and somatic anxiety for male category, and the state self-confidence for female category

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(hypothesis 2.3.3). But, as in the case with the cynical aggression and competitive A-trait relationship, the revealing effects were very weak. This finding is however consistent with the previous observation that, the relationship between this type of aggression with the competitive A-state appeared to be particularly related to "gender" rather than to other sport categories.

A plausible explanation for the absence of or weak relationships between cynical aggression and competitive A-state could be given by Davidson's (1989) argument that (cynical) aggressive play is instrumental in achieving goal objectives in sport by subjugating the opposition, stopping opposition attacks, applying pressure to points of weakness in the opposition, dominating the opposition in set plays. Therefore, competitive A-state would be better predicted using a state measure of aggression.

The early findings of Alpert and Haber (1960) offer another explanation to the results of the study. They distinguished between debilitating and facilitating anxiety and found that a scale which measured both types of anxiety (the Achievement Anxiety Test) accounted for more of the variance in academic performance than a conventional debilitating anxiety scale. Jones and Hanton's (1996) findings are in line with those of Alpert and Haber (1960). On the basis of their research findings, it might be possible to assume that the weak relationship between cognitive and somatic anxiety with the honest type and in particular the cynical aggression is, partly, due to the instrumentation. The CSAI-2 measures the intensity dimension and not the direction of anxiety, which in the case of the cynically (and honestly) aggressive individuals would be facilitating rather than

debilitating.

Angry Aggression with Competitive A-State : With regard to the influence of angry aggression on the competitive A-state components, the results revealed significant effects. Specifically, it was found that angry aggression explained a higher proportion of variance for the cognitive anxiety (5% - 9%) and somatic anxiety (7% - 9%) and lower for the state self-confidence (2% - 5%).

Angry aggression was expected to account for a larger proportion of variance of competitive A-state. This expectation was strengthened by the proposal of Eysenck (1992) that individual's who have least control in their ability to control themselves and the environment, as in the case with angry individuals, are particularly prone to worry. The substantial relationship revealed between competitive A-trait and angry aggression, as well as the results of such studies as those of Polivy (1981), Pankratz et al., 1971; in Mook et al., 1990) and Mook et al. (1990) endorsed further the expectation for stronger relationships between aggression and competitive A-state. As it has been noted earlier (in the review of the literature), the relationships emerged between anger-aggression and anxiety in these studies were much stronger at the state level than at the trait level. The failure of the angry type of aggression to account for a larger proportion of variance of competitive A-state components could be attributed to the fact that, in the studies cited earlier both instruments measured states, but this was not the case in the present study. Thus, although the relationships of the present study are not as strong as expected, they make stronger the belief that, if a state measure of aggression was to be used in a future study, the relationships between aggression and competitive



anxiety would be likely to be much stronger, at least as far as the angry type of aggression with the competitive A-state components is concerned.

Overall, the relationships revealed between the competitive A-state and in particular between somatic anxiety with aggression types seemed to suggest that these relationships may vary as a function of arousal. Thus, these relations may appear stronger during competition (where provocative arousal is in order) or, according to Zillmann's excitation transfer position, immediately after competition.

In sum, the relationship found between cynical aggression with competitive A-state components was limited. Honest aggression was found to influence self-confidence more than the other competitive A-state components while angry aggression was a better predictor of cognitive anxiety and somatic anxiety rather than of self-confidence. In particular, the findings concerned with the relationship between honest and angry aggression with self-confidence can have serious implications for athletes since these seem to be indirectly associated with athletic performance and warrants a brief discussion. Specifically, aggression has been closely related to successful performance (Widmeyer, 1984). This linkage was probably based on the notion that angry people feel strong and more confident about themselves. This can be explained on the basis of the coordination of both the sympathetic and parasympathetic systems which are involved in anger. Specifically, as Izard (1972) has noted "the net effect of the coordinated actions of the sympathetic and parasympathetic systems in anger enables the organism to defend itself or to attack the threatening agent with

increased vigor" (p. 12). Empirical support has been given to this notion from a study conducted by Perry, Perry and Rasmussen (1986). They found that aggressive children were more confident than non-aggressive children of securing disputed tangible rewards through aggression.

However, investigations on this matter in the sport context revealed conflicting results. For example, Sachs (1978) conducted a study with female subjects and reported that success in softball was not related either to reactive or instrumental aggression. On the other hand, a number of early investigations conducted by Ogilvie and Tutko (1965), Kane (1966) and Singer (1969) (cited by Widmeyer, 1984) revealed that the trait of aggressiveness was more prevalent in successful athletes than in less successful athletes.

The findings of the present study seem to present another aspect of this issue. Aggression may enhance performance through self-confidence, but it is the honest type that contributes to this direction rather than the angry type of aggression. Though energy is mobilized in anger for directed action, it is questionable whether this energy can be used for enhancing performance, because anger or heightened hostility directed towards the self or another can often create an attentional conflict for the performer (Baron et al., 1978). This is similar to the results presented by Silva (1980) who conducted a study to examine how aggressive and assertive behaviour affected subject's level of concentration and skill performance. He found that subjects who exhibited proactive assertion had higher concentration scores than did subjects who exhibited hostile aggression. As a result, performance deteriorates and self-confidence decreases. This

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assumption is supported by Kauss (1978) who has noted that, as players stated, they perform much better when they have a task orientation in comparison with an angry orientation. Furthermore, this finding can have important implications concerning athletes' attitude toward aggression/aggressive behaviour and deserves further examination.

### c) GENERAL DISCUSSION ON THE ATHLETIC AGGRESSION TYPES WITH COMPETITIVE ANXIETY RELATIONSHIPS

While these results are evidence that there is relationship between athletic aggression types and competitive anxiety (A-trait and A-state) they are not conclusive. The percentage of variance between predictors and each criterion was not always substantial. As it has been seen for the competitive A-trait with honest aggression relationship, for instance, the percent of variance across categories ranged from a low of 4% (contact sport) to a high of 17% (non-contact sport). Stronger or weaker relationships appeared between the other aggression types with the competitive A-trait and competitive A-state. Though not negligible /unimportant these ranges, larger percents would be desirable to make even more satisfactory conclusions. Several reasons probably account for these ranges.

Crucial variables in studies of this kind are the sample, type of sport and importance of competitive situation (match-game). This study was designed to gain as much control of these variables as possible. However, the nature of the study as well as pragmatic reasons made impossible the complete control of these factors. First, with regard to team sports, subjects were drawn from teams of the first and second national division. For individual sports, athletic clubs recommended by the Federations of sports of interest were selected, and subjects who

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were due to compete in the context of the annual national tournaments (second stage of competitive period) or national competitive events were employed. But, in order to avoid problems due to the small sample size, team athletes of both the first and second national division were included in one category. Also, individual athletes regardless of their placement in previous competitions were included in one category.

Although *subjects'* selection was based on certain criteria, differences may have existed among team members of the first national division or between players of the two national divisions in terms of skill level and experience. Although the differences in terms of the competitive abilities of athletes are not so prominent, nevertheless, it might be possible that their competitive anxiety and aggression states vary to some extent. This explanation is in accord with Prapavessis and Carron (1996) who noted that, in team sport situations not all groups present their members with the same psychological situation. In other words, even within the same sport, teams can vary in structure, cohesiveness, etc., and the impact of these variations on competitive anxiety and aggression is unknown. Similarly, differences among individual sport athletes may also have existed. For example, all weight-lifting athletes who participated in this study were experienced but, some of them were of an international level athletes whereas some others had experience and victories at the national level only. On the other hand, female weight-lifting athletes though successful, had fewer years of competitive experience than their male counterparts or female swimmers.

Evidence has been provided by several investigators who utilized a unidimensional measure of state anxiety that, competitive anxiety

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differently related to varying skill levels and experience. Mahoney and Avener's (1977) study compared gymnasts who qualified for the 1976 United States Olympic team with gymnasts who made the trial but did not qualify for the team. Their findings showed the qualifiers to have a patterning of anxiety different from the less successful nonqualifiers. The successful gymnasts reported being more anxious than the unsuccessful ones prior to the competition, but this situation was reversed during performance (Swain & Jones, 1992). In their study Highlen and Bennett (1983) found that divers and wrestlers of differential skill levels could be distinguished by differences in their anxiety patterns. Successful divers and wrestlers experienced higher anxiety one (1) hour prior to competition, yet reported much lower arousal levels at competition time compared to less successful divers and wrestlers.

More recently Krane and Williams (1987) have continued this type of examination from a multidimensional perspective. They administered the CSAI-2 at three stages (2h, 1h, and 10 minutes) prior to competition and the results showed golfers and gymnasts to have different patterns of change in the CSAI-2 subcomponents. Specifically, somatic anxiety increased during the precompetition period in the gymnasts but remained stable in the golfers. Both groups displayed changes in the patterning of cognitive anxiety and self-confidence, but in the opposite direction; cognitive anxiety increased in the gymnasts but decreased in the golfers as the competition approached and self-confidence decreased in the gymnasts but increased in golfers. Krane and Williams (1987) explained their findings in terms of experience and skill level between the two groups, with gymnasts being less skillful

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and less experienced than the golfers. They further noted that less experienced athletes are not as capable of self-regulation of thought and, therefore, are more prone to suffer from worry as competition approaches. Moreover, Martens et al. (1990) examined how the CSAI-2 subscales differentially related to varying skill levels and sport types. They reported that highly skilled athletes exhibited lower cognitive and somatic anxiety and higher self-confidence than less skilled athletes. Also, Jones and Swain (1995) demonstrated that elite and less elite performers tend to respond differently to their anxiety symptoms. Specifically, a higher percentage of the less elite performers perceived their cognitive and somatic anxiety as debilitating whereas a higher percentage of elite performers perceived their anxiety as facilitative. In the same vein, athletes' experience is likely to affect their aggression levels and in turn, for the reason mentioned above, the relationships under study. Because, existing evidence suggests that experience is related to athletes' aggression levels (Silva III, 1983).

Another factor, in relation to sport category and subjects' treatment as a group, that may have played an important role in the relationship of aggression (particularly the angry type) with competitive anxiety, is the level of athletes' aggression. The role which individuals' level of aggression plays was demonstrated in a study conducted by Celozzi, Kazelskis and Gutsch (1981), who sought evidence regarding the impact of viewing an aggressive contact sport on a spectator audience. Eighty-one male high school seniors were the subjects. Results showed that exposure to violence through the film media had an additive effect on the viewers level of aggression.

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However, results also indicated that the effect was not constant across viewers. State aggression was only increased significantly for those high in trait aggression (Celozzi et al., 1981).

Furthermore, previous research (e.g. Hong & Withers, 1982) demonstrated that individuals high in anxiety had significantly more trait anger. In the present study it was intended to divide the sample into high, medium, and low competitive A-trait groups. But, such a treatment posed some statistical problems in the present study (see phase 2) and finally this strategy was abandoned. However, in a future study, with a more selected sample, it might be quite possible to disclose stronger relationships between high, medium, and low competitive A-trait groups and their respective aggression types levels.

In order to obtain adequate sample sizes for both sexes, it was necessary to test across a variety of sports. As it has been noted in the review of the literature chapter, the nature of specific sports is an important factor in determining precompetitive anxiety and aggressive behaviour. Consequently, an attempt was made to control the variable named "*type of sport*." Despite the sport categorization of contact, non-contact, team, and individual sport, which was based on the key characteristics common to sports included in the same category that is, physical contact and individuality, the overall predictions were lower than expected.

This might be due to the composition of sport categories. For instance, individual sport category consisted of swimmers and weightlifters (objectively scored sports), wrestlers and boxers (subjectively scored sports). This taxonomy served some other important purposes,

such as an attempt to offset the disadvantage in the use of psychological measures with small sample sizes. It is likely that in turn, this strategy adversely affected the predictability of variables, particularly for cynical aggression. Perhaps the physical qualities each sport requires (e.g. endurance, power, speed, etc.), the culture of a particular sport and factors, such as, written and especially unwritten rules, influence in a markedly different way or determine to some extent athletes' moral values and behaviour. On the other hand, multidimensional anxiety theory and research with the CSAI-2 have found differential temporal patterning of cognitive anxiety, somatic anxiety and self-confidence for athletes of different sport as time to compete nears. As noted above, Krane and Williams (1987) reported differential temporal patterning between golfers and gymnasts. Martens et al. (1990) also noted differences between athletes participating in sports scored subjectively by judges compared to sports scored objectively. Athletes in subjective sports had higher cognitive anxiety and lower self-confidence than athletes in objectively scored sports. The groups did not differ in somatic anxiety. The inclusion of more than one sport in the same category is likely to have masked the predictive potentials of variables. This explanation is supported by Males and Kerr (1996) suggestion that, it is possible the different technical and physiological demands of each sport to point to differences in the relative effects of a performer's precompetitive affective state. In a future study, a most effective strategy would be to examine the proposed relationships by adopting the categorization based on both key characteristics, physical contact and individuality (e.g. individual contact sport, individual non-contact



sport, team contact sport, team non-contact sport) and/or avoiding the inclusion of more than one sport in a category (Swain & Jones, 1992). In addition, the type of sport in terms of the way it is scored (objectively, subjectively), if it is open (e.g. wrestling) or closed (e.g. swimming) should be taken into account.

Another factor that has to be considered in relation to type of sport is gender. As it has been noted earlier, results of studies conducted by Jones and Cale (1989) and Jones et al. (1991) showed that cognitive anxiety and self-confidence follow a differential pre-competition patterning in males and females. It is likely therefore that "gender" played a role relative to the type of sport for the relationships under investigation. Thus, the above categorization should be considered and in relation to gender.

According to Van der Ploeg (1983) and Bernstein et al., (1994) stressful evaluative situations, such as training practice and competitive situations, can arise anger and anxiety (El-Naggar, 1993). In such situations, physiological arousal from diverse sources may combine to enhance whatever emotional experiences and responses might occur, and to make aggressive behaviour more likely (Bell, 1992). Findings of Gould, Eklund and Jackson's (1992a) study with Olympic wrestlers is directly supportive of Van der Ploeg's (1983) and Bernstein et al.'s (1994) contention (and indirectly supportive of the aggression-anxiety relationship). Raw data themes of best match mental preparation corresponding to Heightened Arousal-Intensity higher order theme included: Felt nervous but not pressured, mad, wanted revenge. Raw data themes of crucial match mental preparation corresponding to Non-Optimal Feeling States higher order sub-theme included: More

butterflies than usual, over psyched, too tense/angry. Acknowledging the impact of these situations on athletes' psychological states, an attempt was made by the present study to control the variable named *importance of competition*. Hence, data was gathered in both training practices and prior to official competitions, within the same competitive period in order to make sure that these situations were important for athletes. Although this goal can be achieved to some extent, it does not guarantee the same degree of importance for all participants and across all competitions. For example, team and individual athletes who secured their stay in the first or second national category and their placement amongst the best (usually the first three positions) respectively, competitions were important but not as crucial as for those athletes who struggled to avoid disqualification or relegation to another category. Consequently, their responses on the instruments were directly proportional to their competitive status as it was shaped accordingly to the outcome of the most recent match-competition, because, as the existing literature suggests, high levels of situation criticality are associated with high levels of competitive A-state. An early study of Lowe (1973) who investigated the relationship between the criticality of a situation and physiological arousal (measured as heart rate) with little League baseball players, demonstrated that the criticality of the situation correlated with athletes' heart rates; higher heart rates were associated with increased situation criticality. In a recent study Krane, Joyce and Rafeld (1994) examined the relationship among person factors, situational factors, and batting performance during a collegiate softball tournament. Participants in this study were 11

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members of Division I women's softball team. They found that high levels of situation criticality were associated with high levels of cognitive anxiety, but not with the somatic anxiety.

It must be noted here that there were some other factors which posed problems on the control of this variable. There have been times when this researcher was not allowed to administer the questionnaires to athletes (team members and individual athletes) prior to a crucial match because the whole procedure of the questionnaire completion was perceived by coaches or team administrators as being very destructive for athletes. Although athletes, when they were asked, stated that "all games are important and anxiety provoking", however, and as the proceeding discussion showed, this is not true in absolute terms. It is well-known that the competitive status and the fame of an opponent (strong, weak) can be awe-inspiring or at least cause uneasiness or more relaxed feelings.

In addition, in some cases the result of the previous game-match was decisive for the final placement of a team or an athlete, thus determining the critically of the forthcoming competition. Previous research has shown that, an athlete's mood is influenced to a large extent by the outcome and even more so when the outcome is crucial to further participation (Hassmen & Blomstrand, 1995; McAuley et al., 1983; Robinson & Howe, 1987). This was especially true for the individual sport athletes (e.g. wrestlers, who usually had two bouts to compete in the same meeting). However, the reasons mentioned above and the large number of teams and athletes who participated in the study, made it impossible for the author to be kept informed of these sudden turns in competitive developments.

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Moreover, these competitive developments affected athletes' performance expectations and their competitive A-state. Research has demonstrated that changes in expectations for success prompt corresponding changes in self-confidence and cognitive anxiety (Bandura, 1989; Martens et al., 1990; Morris et al., 1981). Recently, Krane, Williams and Feltz (1992) found that low performance expectations were associated with high cognitive anxiety. Burton (1988) noted that when expectations for success decrease, a cognitive affective stress reaction occurs in which cognitive anxiety increases and self-confidence declines. Also, cognitive anxiety was found to increase upon receiving negative feedback, whereas positive evaluative feedback was related to a decrease in cognitive anxiety (Caruso, Dziewaltowski, Gill & McElroy, 1990). As the multidimensional anxiety theory predicts, situations perceived to be more threatening and a lower chance of success, are expected to invoke greater cognitive anxiety. In relation to the aforementioned is Bandura's (1989) suggestion that, individuals are self-evaluative and compare their desired performance with expected capabilities. If this comparison is negative, it will result in cognitive anxiety; if positive, it will result in high confidence and motivation. Therefore, it may be possible that last minute information about opponents' competitive status or other evaluative cues perceived by athletes of the present investigation as positive or negative feedback may have affected their performance expectancies and competitive state anxiety. Moreover, the available evidence suggests that stress reaction prompts excessive overanalysis that disrupts concentration from the task at hand and focuses attentional processes on negative thoughts and other internal

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processes (Martens et al., 1990; Wine, 1980; Burton, 1989). The effects of stress reaction on honest aggression, on the one hand, and the employment of absolute scores of competitive anxiety and aggression types (instead of high and low group scores) on the other may be responsible for the weak relationship between honest aggression with cognitive anxiety.

In relation to the aforementioned is Krane and Williams (1987) argument that the way athletes perceive their athletic competition is reflected on their state anxiety. They noted that in their study with golfers, who were competing in a practice round of an individual tournament, and gymnasts who were competing in a conference meet, the latter may have placed greater importance on success than did the golfers, resulting in the gymnasts having more cognitive and somatic anxiety and less self-confidence than the golfers. With respect to the subjects of the present study, participants were players from different teams, and is quite possible that some of them placed greater importance on success than others, e.g. in play-offs games. Therefore some of them experienced higher levels of cognitive and somatic anxiety and lower self-confidence, while some others lower levels of competitive state anxiety and higher self-confidence. Inclusion of all teams in the same category may have had a balancing effect on athletes' competitive state anxiety levels which in turn affected the relationship between aggression types and competitive anxiety.

Another factor that may have affected the predictive ability of variables and is also related to performance expectations was the fact that, because of tournament scheduling, the questionnaires were filled out at various times during the tournament. Both the SCAT and AAI had

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to be filled out in training sessions while the CSAI-2 prior to competition. Sometimes all three questionnaires were completed within the same week and some other times CSAI-2 was completed 2 or 3 weeks later. This was due to several reasons such as not having access to places where competitions were taking place (e.g. in islands). The situation and expectations, therefore, regarding a team's or individual athletes' competitive status might have been changed and affected their responses to CSAI-2. Existing evidence suggests that competitive anxiety is related to athletes' success or failure in prior competitions. Because athletes fear failing, those who believe they have failed in the past may be more anxious in competitive situations than those who believe they have been successful (Rainey & Cunningham, 1988).

Some other explanations regarding the weak relationships between aggression types and competitive anxiety, not necessarily mutually exclusive, are given below. With regard to anxiety, the concept that has prevailed has typically been considered negative and harmful to performance. However, some of the recent literature suggest that anxiety can have positive effects (Jones et al., 1993). The CSAI-2, on the other hand, essentially measures the intensity of symptoms that are regarded as indicators of the presence of anxiety and not the "directional perceptions" of the symptoms that is the nature of the individual's interpretations of those symptoms (facilitative or debilitating) (Jones, Swain & Hardy, 1993; Jones & Swain, 1995). With respect to aggression types, as noted previously, the weakness of honest aggression to account for substantial proportion of variance for cognitive anxiety may be due to the fact that cognitive anxiety, as

measured by the CSAI-2, is characterized by negative expectations, a lack of concentration, and disrupted attention (Morris, Davis & Hutchings, 1981). Honest aggression on the other hand is characterized by the ability to keep under control, determination and focus on the task. Therefore, perceiving cognitive anxiety as debilitating and assessing only the intensity dimension, may be responsible for these results. Similar reasons may account for the failure of cynical aggression to predict competitive A-state. In cynical aggression no anger is involved and the athlete is cool and calculative in planning his/her actions for achieving his/her goal. It is quite possible therefore that, employing the direction dimension of anxiety in a future study, stronger relationships may be revealed between types of aggression with competitive A-state components. In the same vein, the frequency dimension of competitive anxiety should be employed for testing the proposed relationships.

It has been noted that arousal is the element mostly involved in the angry aggression type and competitive A-state components. Hence, it was not unreasonable to expect strong relationships between these psychological states. The assumption made in the review of the literature regarding this issue was confirmed. Angry aggression was the type which showed the stronger relationships with cognitive anxiety and somatic anxiety, compared to the other two types of aggression. More specifically, findings concerning the relationship of angry aggression with somatic anxiety appeared to be slightly stronger for some categories, e.g. individual sport category, than those between angry aggression with cognitive anxiety. Perhaps the time athletes completed the CSAI-2 is responsible for the observed differences between angry

aggression and somatic anxiety. Findings concerning the precompetition temporal patterning of the state anxiety components of the CSAI-2 are fairly consistent and show that cognitive anxiety tends to remain constant during the precompetition period while somatic anxiety tends to increase rapidly near the start of the event (Martens et al., 1990). Individual sport athletes of the present study completed the questionnaire closer to the commencement of competition than did team athletes. This result may suggest that the assessment of somatic anxiety should be done immediately prior to competition employing not only psychological but also advanced physiological measures.

Although these findings signify the role of arousal in the relationship of angry aggression with competitive A-state components, on the other hand they stress the weakness of arousal to count as the predominant factor for these relationships. This view seems to find support through the findings of Konecni (1975). The aim of Konecni's investigation was to test the arousal-aggression linkage. Subjects of his study were first either insulted or treated neutrally by a confederate and then exposed to presumably arousing sounds during the performance of aggressive responses. Among others, he observed that any arousal differences produced by exposure to sounds had no effect on subjects who had not been provoked, an observation that corroborated earlier findings on exertion-induced arousal in actual performance (Zillmann, Katcher & Milavsky, 1972). Arousal then appeared to have facilitated aggressive behaviour only when such behaviour was motivated by alternative means. His findings in relation to the present investigation would suggest that aggression is situation specific and probably is determined by the competitive situation and especially the



strategies of play adopted in each competition (Gaskell & Pearton, 1979). This suggestion seems to be in line with Leith's (1989) observation that different strategies of physical activity differently affect the amount of elicited aggressiveness in the participants.

With regard to cynical aggression high arousal levels may be not necessary. As Bandura (1973) noted aggression may occur in the absence of an emotional state. Therefore, athletes arousal level raised because of the competitive situation would be quite enough for facilitating this type of aggression. To find out the underlying factors responsible for the insignificant relationships we should turn our attention to other directions. In a study conducted by Enker (1987), in taped interviews with some of the students it was found that, American students who felt very uncomfortable about cheating (that cheating was wrong but, in some way, the system forced them into it) reported great cognitive dissonance, anxiety, and guilt. Students who felt "comfortable" about cheating did not report any great dissonance, anxiety, and guilt (Enker, 1987). It might be possible that, the way athletes feel about their cynical aggression when they are forced, e.g. by significant others such as coach, teammates, is a factor that may reveal covered aspects of this type of aggression. In addition, its relationship with competitive anxiety may emerge stronger for those who feel uncomfortable about their cynical aggression than for those who may feel comfortable.

Another convincing explanation could be that while cynical aggression is negative, as is angry aggression, cynical aggression is not strictly characterized as a personal attack on others as is the case with angry aggression, but is seen as functional to the sport

context. It is likely, therefore that the absence of the personal element in cynical aggression may partly account for the failure of cynical aggression to predict competitive A-trait or even competitive A-state.

Finally, the positive and negative effects revealed for cynical aggression and competitive anxiety (A-trait, A-state) relationships with regard to male and female athletes category are quite challenging and stress the need for further, systematic investigation of factor gender. In other words, the question generated is whether examining the relationships of interest for each gender separately and within each sport category would reveal similar results or more strong and significant relationships.

The preceeding discussion corroborates the existence of the relationship between athletic types of aggression with competitive anxiety. Despite the limitations and pragmatic reasons posed in this investigation, substantial relationships emerged, although this was not the case for the cynical type of aggression with the competitive anxiety. It is evident that some of the components of the aggression types are more strongly associated with competitive anxiety (A-trait or A-state). Moreover, studies on moral phenomena have revealed the crucial influence that situational variation has on the incidence on moral behaviour (Leming, 1980). Therefore, these relationships should be examined under various conditions (e.g. low, medium, high risk conditions).

It has also become evident that for a more accurate prediction of aggression types from competitive anxiety and vice versa other factors should be taken into account. Research has shown that precompetitive

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temporal patterning of multidimensional anxiety differs as a function of such factors as type of sport, gender, athletes' competitiveness (Swain & Jones, 1992). Also, it has been suggested that the relationships under study will be much stronger if they are to be tested taking into consideration the direction and frequency dimensions of competitive state anxiety. The frequency and direction of aggression types should also be examined. According to Buss (1961, p.198), aggressiveness is dispositional and concerns the characteristics of individuals, thus implying individual differences in frequency or intensity of aggressive responding (Edmunds & Kendrick, 1980). Therefore, it would be premature to reach any conclusion regarding the relation of aggression types with competitive anxiety without examining carefully every possibility.

## CHAPTER 6

### SUMMARY OF FINDINGS - DIRECTIONS FOR FURTHER RESEARCH

SUMMARY OF MAIN FINDINGS

The exploratory nature of this field investigation prohibits the derivation of *definite* conclusions about the athletic aggression - competitive anxiety relationship. However, the results revealed interesting findings which are summarized in what follows.

1. The model proposed by Hodgson (1990) was tested, its main aggression types (honest, cynical, angry) were supported, and a new questionnaire, the *Athletic Aggression Inventory (AAI)*, was developed. The results from both the pilot study and main research supported both the reliability and validity of this instrument.

2. The *Sport Competition Anxiety Test (SCAT)* (Martens, 1977) and the *Competitive State Anxiety Inventory-2 (CSAI-2)* (Martens et al., 1990) questionnaires showed satisfactory reliability and construct validity when tested with a Greek population.

3. *Athletic Aggression Types - Sport Category* : Individual non-contact sport athletes were significantly lower (high scorers) in cynical aggression than were athletes of the other sport categories.

- Contact sport athletes were more cynically aggressive (low scorers) than non-contact sport athletes.

- There were no significant differences in honest and angry aggression among athletes of different sport categories.

4. *Athletic Aggression Types - Gender Differences* : Male athletes across sport categories were higher in honest aggression (low scorers) than were female athletes.

- Male athletes of the total sample, non-contact and individual sport category were higher in cynical aggression (low scorers) than were female athletes of the same categories.

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- Male athletes of the total sample, non-contact and individual sport category were lower in angry aggression (high scorers) than were female athletes of the same categories.

5. *Competitive A-Trait, A-State - Sport Category* : Non-contact sport athletes were higher in competitive A-trait than were athletes of contact sport category.

- Individual sport athletes were higher in competitive A-trait than team athletes.

- Individual contact sport athletes were significantly higher in competitive A-somatic than athletes of other sport categories.

6. *Competitive A-Trait, A-State - Gender Differences* : Female athletes across sport categories were significantly higher in competitive A-trait than were male athletes.

- Female athletes of the total sample, non-contact, team, and individual sport categories were significantly lower in state self-confidence than were male athletes.

- Female team sport athletes were significantly lower in A-cognitive than were male athletes (but lower in state self-confidence than males).

7. *Relationships Between Athletic Aggression Types and Competitive A-Trait* : Honest and angry aggression was related to competitive A-trait across categories, whereas cynical aggression was related to A-trait only for the male and female category.

8. *Relationships Between Athletic Aggression Types and Competitive A-State* : Honest aggression appeared to be a better predictor of athletes state self-confidence across categories but a poor predictor with regard to A-cognitive and A-somatic. The predictive ability of

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cynical aggression for the competitive A-state components was limited to male and female category. Angry aggression was a better predictor for A-cognitive and A-somatic across categories than was for state self-confidence.

### STRENGTHS AND LIMITATIONS OF THE STUDY AND ADDITIONAL DIRECTIONS FOR FURTHER RESEARCH

The importance of the social and cultural context in shaping human behaviour has been stressed in previous chapters. In the words of Bernstein et al. (1994), "unless we at least recognize the importance of culture and social values, we miss an important interpersonal antecedent of aggression" (p. 654). The acknowledgement of the culture as a predisposing variable to aggression and the development of the AAI to measure Greek athletes aggressive behaviour is one of the strengths of the present study. The AAI was constructed to measure aggression of athletes from a wide range of sports (contact, non-contact, team, individual), by using the qualitative and quantitative approach. These methods allowed the investigator to "get into the heads" of the Greek athletes and achieve much more understanding of the factors influenced their aggressive behaviour. The first phase of the data analysis was inductive in nature and involved looking for themes that emerged from the interviews and open-ended questionnaires. At a later phase, the themes identified were used in a deductive analysis that involved forcing these themes on Hodgson's model. Finally, the researcher's biases were controlled by using statistical analyses for item selection and validation procedures. The analyses also revealed a number of similarities between the Greek sample of this research and American

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athletes responses in other researches. The AAI supported Hodgson's model in terms of the main types of aggression (honest, cynical, angry) and was shown to be a valid and reliable measure of athletes' aggression. It can be a useful measurement tool for coaches and sport psychologists who provide psychological services to athletes, because many of them for the assessment of athletes' psychological states rely on self-report questionnaires (Williams & Krane, 1989).

The scale of honest aggression in this inventory is particularly important because this type of aggression is not included in existing aggression instruments. Honest aggression (or assertion) is a necessary ingredient for success and effective participation (Connelly, 1988) and can help athletes improve their performance because qualities of this type of aggression, such as, intense concentration, determination, self-control are also characteristics of peak performance (Gould et al., 1992). Honestly aggressive players do not let opponents take advantage of them, nor are they easily dominated, yet they are also respectful of the opponents' skills and personal safety (Bredemeier, 1994). The implication of this focuses on the need to help coaches and sport psychologists identify athletes' honest aggression levels and then to find the means for increasing the probability that honest aggression will be demonstrated properly and frequently. According to social learning theory, aggressive behaviour is acquired through experiences in which individuals are directly rewarded for such behaviour, or when it is observed that an aggressive model is rewarded as is very often the case in sports. In the same vein, various forms of positive reinforcement strengthen the probability that honest aggression will be repeated. The other two types, the cynical and angry



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aggression can also be measured with the AAI. Detecting first levels of these aggression types, modification of cynical and control of angry aggression can be pursued and achieved. The work of Weiss et al. (1984) and Wandzilak et al. (1988) indicated that social learning theory is successful in producing changes in moral reasoning skills. Loss of control on the other hand can impair performance. The present research findings demonstrated that increases in competitive A-trait are associated with increases in angry aggression and reversely. Therefore, intervention strategies for the control of angry aggression may have (indirectly) an effect on competitive A-trait.

A second strength of this investigation was the standardization of the SCAT and CSAI-2 competitive anxiety instruments with Greek athletes, which may facilitate future research in competitive anxiety in Greece.

Another important feature of this study was that differences in aggression and competitive anxiety were examined for sport categories (contact, non-contact, team, individual) and gender. It has led to an advancement of knowledge regarding Greek athletes' aggression and competitive anxiety. Moreover, the evidence provided support for the relationship between aggression and competitive anxiety and a consistent pattern in some of the relationships across categories. For example, honest aggression was found to be consistently related to self-confidence across categories. Their positive relationship suggests that increases of the honest aggression levels positively affect self-confidence which is an important aspect of the psychological make-up of the individual athlete (Clifton & Gill, 1994; Weiss, Wiese & Klint, 1988). This relationship, therefore, makes obvious the possibility of

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a two-way (two-directional) intervention. In the same vein, the other relationships which this study revealed could be shown to be useful for an effective approach for the regulation of psychological states of athletes (e.g. angry aggression with competitive A-trait).

In sum, it is desirable for coaches and practitioners to detect each athlete's levels of aggression types and their relationship with competitive anxiety. This knowledge will allow them to develop athlete-specific competitive plans to help athletes achieve and/or maintain control over their internal states.

Finally, the context of this study was another strength. Experiments in laboratories always leave investigators wondering how well their findings generalize back to real-world settings (Burton, 1989). This field investigation, despite certain problems and uncontrollable variables that may have confounded results, demonstrated that aggression types and competitive anxiety are related in a real sport setting.

Restrictions within the scope of the study were inevitable. As with most investigations, this study only answered a number of questions but it raised some others and identified new areas that need further research. For instance, especially intriguing is the question of why the relationship between cynical aggression and competitive anxiety was very weak or insignificant. These results could have been influenced by the different levels of moral reasoning of males and females who were included in the same sport categories, or by other factors, such as competitive experience. The generation of such questions is not surprising since no examination of this issue has been

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done before. Some limitations arose out of unforeseen concerns, which have been included in suggestions for future research, and are summarized below:

Since the data was based on Greek athletes, the findings and conclusions drawn from the present study should be limited to the particular population which was studied. More cultural and "cross-cultural" research is needed to find out how psychological factors and behaviours vary in different cultures (Biddle, 1995).

Personal problems of athletes (e.g. injuries) or other information regarding athlete's interaction with the coach, teammates etc., were not taken into account prior to the administration of the questionnaires.

The sample was drawn from certain sports and consequently the findings provide evidence with respect to those sports (Table A.13.1). Therefore, levels of athletic types of aggression, competitive A-trait and competitive A-state may differ across other sports.

Team athletes participated in the first and second national category. The pressure for exceptional performance is more or less the same for all athletes. However, the impact of competition and its outcome (winning or losing) may differently affect athletes of these categories; the levels of competitive anxiety and/or aggression for athletes of the second national category may be different than for athletes of the first national category. The study of Gould, Eklund and Jackson (1992a) corroborates this view by showing that differences exist even in a sample as homogeneous as an Olympic team. Specifically, within the higher order theme of arousal-intensity feeling states, observable differences were evidenced between medalists and

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nonmedalists. The findings suggest that the aggression-competitive anxiety relationship should be examined in a future study with a more select sample than that used in this study. For instance, only team athletes of one (e.g. first, second, or third) national category and individual athletes who were placed in the first three or first six positions in Panellenic events, or according to their record in the previous competitive season.

With regard to team sports, since there was not a research team, the investigation took place in the mid-competitive period (second round) for some teams and at the end of the competitive period or the play-offs period for some others. It would be interesting to explore competitive anxiety and aggression ranges by conducting a longitudinal study (beginning, middle and end of the competitive period) for both first and second rounds. Similarly, the competitive anxiety and aggression levels of the individual sport athletes could be estimated by carrying out the investigation in the pre-competitive, competitive, and post-competitive period. Athletes' reactions to the actual events of competition have not been often assessed (Gould, Eklund & Jackson, 1992a). During the course of competition changes happen so rapidly, especially in open sports, and often the outcome is unknown till the last minute (Krane, Joyce & Rafeld, 1994). In fact, situations involving different levels of perceived importance and provocation will occur intermittently and the accompanying anxiety (Fisher & Zwart, 1982) and aggression levels will change too. For this reason, situational facets within competition related to the measures of aggression and competitive anxiety should be considered.

There is evidence that psychological states vary over the

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precompetition and competition time frames (Passer, 1988). Thus, a limitation of the design of the present investigation was that the time to event paradigm was not employed and/ or data was not collected just prior to competition. Pragmatic reasons (access to teams and places where competitions took place, non availability of a research team) and others such as, different sport categories and the large sample size, made it impossible. Moreover, coaches sometimes did not allow the researcher to distract athletes from their precompetitive routines close to the commencement of competition. It might be possible, however, to overcome these problems with a smaller sample size from only one sport category; pre-, mid-, and post competition measurements (Annesi, 1997; Harger & Raglin, 1994) of competitive anxiety and aggression would provide valuable information for both researchers and coaches alike, especially if both time frames could be examined. For this type of investigation, however, intra-individual statistical analyses will be most appropriate.

Moreover, this type of investigation is a major challenge for investigators to confront, and requires the use of more assessment tools. The present investigation was based on information collected via the completion of self-report questionnaires. Recently, however, a more advanced level of understanding of physiological process has been achieved with sophisticated equipment less susceptible to movement. Physiological measures, therefore, have much potential for use as reliable indicators of physiological responses than they used to be in the past. The combined use of both questionnaires and physiological measures (Edwards & Hardy, 1996), especially those that have shown promise in discriminating psychological states, such as, systolic blood

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pressure, diastolic blood pressure, finger temperature, etc. (Neiss, 1988), would be a promising approach for investigation in this area. Additionally, since research evidence suggests a significant correspondence between actual and recalled precompetitive affect among athletes, means such as interviews could be used together with: observation; information regarding athletes' past sport history; video analysis and examination of photographs to study non-verbal behaviour, and expressions which signify aggression and anxiety, could be employed. In particular, videos and/or photographs may be also used to stimulate the athlete's recollections of specific events and situations in competition (Snyder, 1990). Moreover, this approach may prove more effective in detecting an athlete's intention which is one of the major difficulties in assessing aggression and achieving a deeper insight into this issue. In addition, data on aggression that can be collected through players' sanctions (e.g. yellow and red cards in team sports) which are officially recorded, and also through asking the athlete, whilst taking into consideration factors such as being in a losing or winning state of the game (Lefebvre et al., 1980), penalties in the history of the team or the individual athlete, etc., are also possibilities. The knowledge that can be gained adopting these strategies would provide valuable information for both researchers and coaches alike, taking our understanding of athletic aggression, competitive anxiety and their relationship a step further.

In this study team athletes' aggression and competitive anxiety states were examined regardless of their position, and the particular role they hold in the team (e.g. goalkeepers) or their status (e.g. starters, substitutes), etc.. This was also the case with individual

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sport athletes whose speciality in a particular event (e.g. short or long distance swimmers, in freestyle or breaststroke, etc.) was not taken into account. There is also evidence that different sport or events are associated with different types of fatigue (e.g., volleyball players experience more mental fatigue, while endurance athletes experience more physical fatigue) which may affect both aggression and anxiety. On the other hand researchers (Jones & Swain, 1995) speculate that it is likely that high intensity of the competitive anxiety symptoms will be interpreted as facilitative for short duration explosive sports but as debilitating for longer duration, and more finely controlled skills. Investigating the aggression, competitive anxiety and their relationship within the context of a particular sport with regard to event, role, speciality or position in the team of athletes, could be a challenge for future research.

Other factors that affect athletes' psychological states are spectators and game location (Tenenbaum et al., 1997). Sports practice has verified the influence of spectators' presence on athletes aggression and competitive anxiety. Studies have demonstrated different influences of spectators' reactions on the performance and behaviour of both the home team and their opponents (Slepicka, 1993, 1995; Thirer & Rampey, 1979). Since spectators' reactions, either at home sportsground or at opponents' sportsground, act either as a supportive stimulus or as discouraging stimulus respectively, their influence on athletes should be considered in future studies.

Anastasi's (1982) point of view that "... the test construction procedures are still in the process of development" (p. 559) sends the message that further refinement of the AAI is necessary to more

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accurately depict athletes' aggression levels as well as the relationship between aggression and competitive anxiety. More indepth research concerning AAI subcomponents and dimensions (e.g. frequency) should be pursued, developing the full model for the AAI to represent the main types and subtypes of athletes' aggression. Also, a children's version of the AAI should be developed to add to the body of knowledge about children's aggression. Another candidate for future research must be the construction of a questionnaire for each sport category. Such a questionnaire should be designed to capture the conditions and characteristics which might be prominent in a particular sport category.

The precompetitive period is commonly perceived by sport psychologists as being stressful for the athlete (Crocker, 1992) and as such was measured in the present study. Thus, the questionnaire used to measure competitive state anxiety (CSAI-2) represents the intensity of cognitive and somatic anxiety symptoms. However, recent empirical research suggest that prior to competition anxiety symptoms are interpreted as facilitative rather than debilitating by some athletes (Jones & Hanton, 1996). Having in mind the discussion made about the aggression types, it seems quite possible that types of aggression could be related more strongly with the debilitating or facilitative anxiety symptoms. Therefore, the development and/or validation and further usage of directional and frequency measures of anxiety with Greek athletes would offer the best opportunity to progress to a greater understanding of the aggression types with competitive anxiety relationships.

Apart from the variables examined in this investigation (e.g.



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type of sport, the gender of the athlete, etc.), other environmental factors may determine the intensity and frequency of the competitive anxiety and especially of aggression and their relationship. It is well documented that environmental conditions (Kryter, 1970) are sources of stress, and can influence whether a person displays aggression (Holahan, 1986). For example, noise tends to make people more likely to display aggression especially if the noise is unpredictable and irregular (Bernstein et al., 1994). Other environmental conditions such as high temperatures are a source of stress, and aggression and violence are most likely to occur during the hottest days (Anderson, 1989; Bell & Fusco, 1989). Examination of a variety of situational and environmental factors which are operational in and around a sporting context is needed (Orlick, 1974; in Ostrow, 1990). Thus, the task of future research may be to determine the effect environmental variables have on athletes' aggression and competitive anxiety and their relationship under various sport situations and conditions (in terms of importance of game, high-low risk).

Furthermore, this study should be replicated and, since sports scored subjectively by judges elicit higher levels of competitive anxiety than sports scored objectively (Gould, Petlichkoff & Weinberg, 1984; Krane & Williams, 1987; Martens et al., 1990) a re-categorization of sports should be adopted which may reveal stronger relationships. For instance, a category may include sports which are contact, individual, subjectively scored, and open such as wrestling. Or, another category may include sports which are non-contact, individual, objectively scored, and closed such as swimming. In addition, the demographic characteristics (e.g. age, experience, etc.) that appeared

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to influence to a great extent aggression and competitive anxiety should be included in a further examination.

Research has shown that individuals' goal orientation (task, ego) was associated with the likelihood of aggressive acts (Duda et al., 1991). Specifically, these findings demonstrated that ego oriented individuals would be more likely to exhibit a "win at all cost" attitude which might include aggressive and cheating behaviour in their quest of victory (Stephens & Bredemeier, 1996). These findings suggest that, in a future examination of aggression types, and their relationship with competitive anxiety, should take into consideration individuals' goal orientation.

Finally, an ambitious plan for future research would be a longitudinal study for investigating the family conditions and other personal characteristics of parents (e.g. parents aggressive with each other and toward their children, overbearing or dominant parents, etc.) of those young athletes who attend the athletic schools; studying together family conditions and athletes aggression and competitive anxiety levels will be worthy and appealing hypothesis which should provide further insight into the aggression and competitive anxiety relationship issue.

As a concluding comment, it could be stated that the present era of concern about athletes' aggression and competitive anxiety epitomizes the importance of the results produced by this study. In evaluating the findings, however, it is imperative that both the strengths and limitations of this investigation be taken into account. Despite the limitations which confound the extent of the results, this

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exploratory effort, with the evidence provided, has made a valuable contribution to understanding Greek athletes' aggressive behaviour, competitive A-trait, competitive A-state and their relationship. In addition, the AAI sport-specific instrument tailored on Greek athletes provides a means of collecting data, and directions for further research are offered. Nevertheless, future research needs to avoid the weaknesses of the present study, and build on the questions raised in order to go deeper, give answers which may provide a more effective and comprehensive evaluation of the athletic aggression with competitive anxiety relationships. What remains to be done is further testing of the suggested hypotheses, because, "testability is the absolutely essential characteristic of any scientifically useful hypothesis" (Marx, 1961; in Neiss, 1988, p. 355).

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THE RELATIONSHIP BETWEEN AGGRESSION AND ANXIETY IN DIFFERENT SPORT  
CATEGORIES

A thesis submitted to the University of Manchester for the degree of  
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## APPENDICES

APPENDIX 1

SPIELBERGER'S (1972) THEORY OF ANXIETY:  
THE CONCEPTUAL DISTINCTION BETWEEN A-TRAIT AND A-STATE

The assumptions of Spielberger's (1972a) anxiety theory are as follows:

1. External or internal stimuli that are appraised by an individual as threatening evoke A-state reactions. High levels of A-state are experienced as unpleasant through sensory and cognitive feedback mechanisms.
2. The greater the amount of threat a situation poses for the individual, the more intense the A-state reaction will be.
3. The longer the person interprets a situation as threatening, the more enduring the A-state reaction.
4. Compared with individuals low in A-trait, individuals high in A-trait will perceive more situations or circumstances that involve failure or threats to self-esteem as threatening, and respond with more intense A-state reactions. Evidence indicates that situations involving potential failure or threats to self-esteem are more potent sources of threat than are potentially physically harmful situations. It is primarily through past experiences that some persons acquire high or low A-trait.
5. Elevated levels of A-state have stimulus and drive properties that may be manifested directly in behaviour or that may serve to initiate psychological defenses that have been effective in reducing A-states in the past.
6. Stressful situations frequently encountered may cause an individual to develop specific psychological defence mechanisms or coping responses that are designed to reduce or minimize A-state.

Figure A.1.1 illustrates the conceptual distinction between the A-trait and A-state.

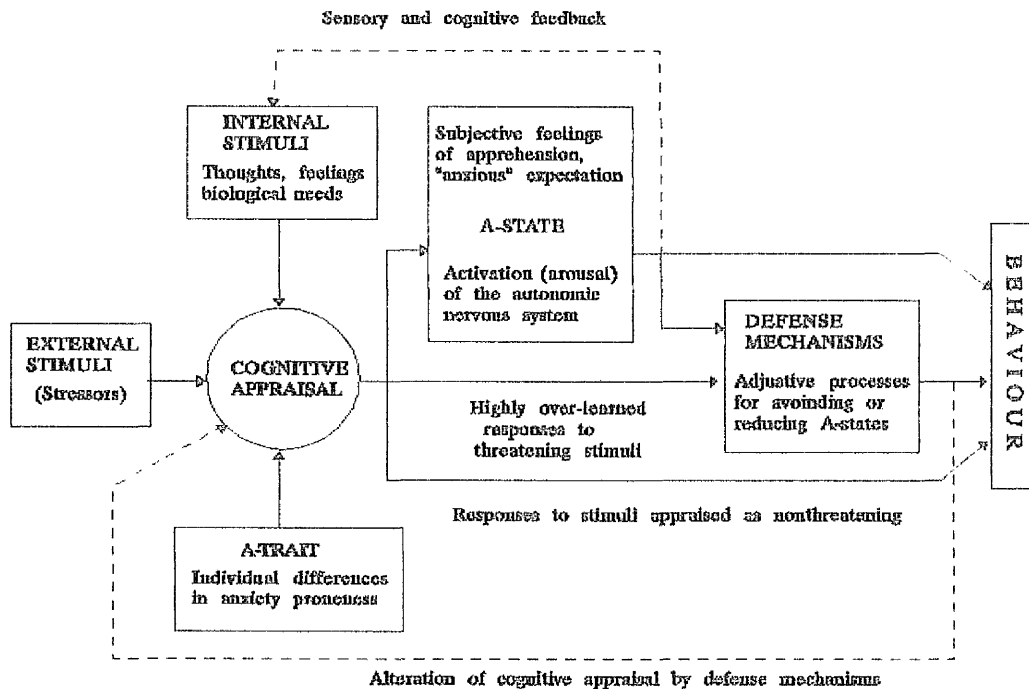


Figure A.1.1: A trait-state conception of anxiety in which two anxiety concepts, A-trait and A-state, are posited and conceptually distinguished from the stimulus conditions which evoke A-state reactions and the defenses against A-states. It is hypothesized that the arousal of A-states involves a sequence of temporally ordered events in which a stimulus that is cognitively appraised as dangerous evokes an A-state reaction. This A-state reaction may then initiate a behaviour sequence designed to avoid the danger situation, or it may evoke defensive manoeuvres which alter the cognitive appraisal of the situation. Individual differences in A-trait determine the particular stimuli that are cognitively appraised as threatening (Adapted from Spielberger, 1966; p. 17).

## APPENDIX 2

### DESCRIPTION OF THE NERVOUS SYSTEM

The nervous system is comprised of two branches, the central nervous system (CNS), and the autonomic nervous system (ANS). The CNS consists of the brain, the brain stem, and the spinal cord and controls the voluntary muscles and organs. The ANS controls the involuntary muscles and organs and is directly related to arousal. The ANS is itself comprised of two branches the sympathetic nervous system (SNS) and the parasympathetic nervous system (PNS). The SNS is responsible for changes in bodily functions which are associated with arousal (e.g. increase in heart rate, increase in respiration, sweating of the hands) and releases catecholamines (adrenalin and noradrenalin). On the other hand, the PNS produces the opposite effect to the SNS in any given organ maintaining in this way homeostasis in the various peripheral organs<sup>1</sup>.

The structures of CNS responsible for the control of arousal are located in the brain and involve the cortex of brain, the hypothalamus, and the reticular formation or ascending reticular activating system (ARAS).

The Cerebral Cortex is the area of the brain responsible for higher brain functions and conscious thought processes and is comprised of a thin layer of neurons. Changes of the electrical activity produced in the cortex can be monitored with the electroencephalograph (EEG). Desynchronized or synchronized patterns of EEG waves are associated with high or low states of arousal respectively.

The Hypothalamus plays an important role for the arousal reaction. Stimulation of the (posterior) hypothalamus causes alertness and excitement as well as secretion and release of catecholamines by the adrenal medulla.

The Reticular Formation or the ascending reticular activating system (ARAS) -a complex of neurons and nuclei- is interconnected with the cortex and hypothalamus and is responsible for organizing sensorimotor behaviour. These three structures are associated with the onset of arousal. When a situation is perceived as threatening or arousing by an individual then the reticular formation is activated and this in turn governs the arousal sequence which will result in the arousal reaction. Fowles (1981) has noted that the creation of reticular activating system model that was assumed to serve as a generalized arousal mechanism responding to various sensory stimuli, energizing behaviour and producing both electroencephalographic and sympathetic nervous system

---

<sup>1</sup>The SNS and the PNS trigger the peripheral organs by different chemical messengers which are known as neurotransmitters. The main SNS neurotransmitter is called norepinephrine (noradrenaline) (NE) and only a small amount of epinephrine (E) is involved. The PNS neurotransmitter is called acetylcholine (ACH) (Kemper, 1978).

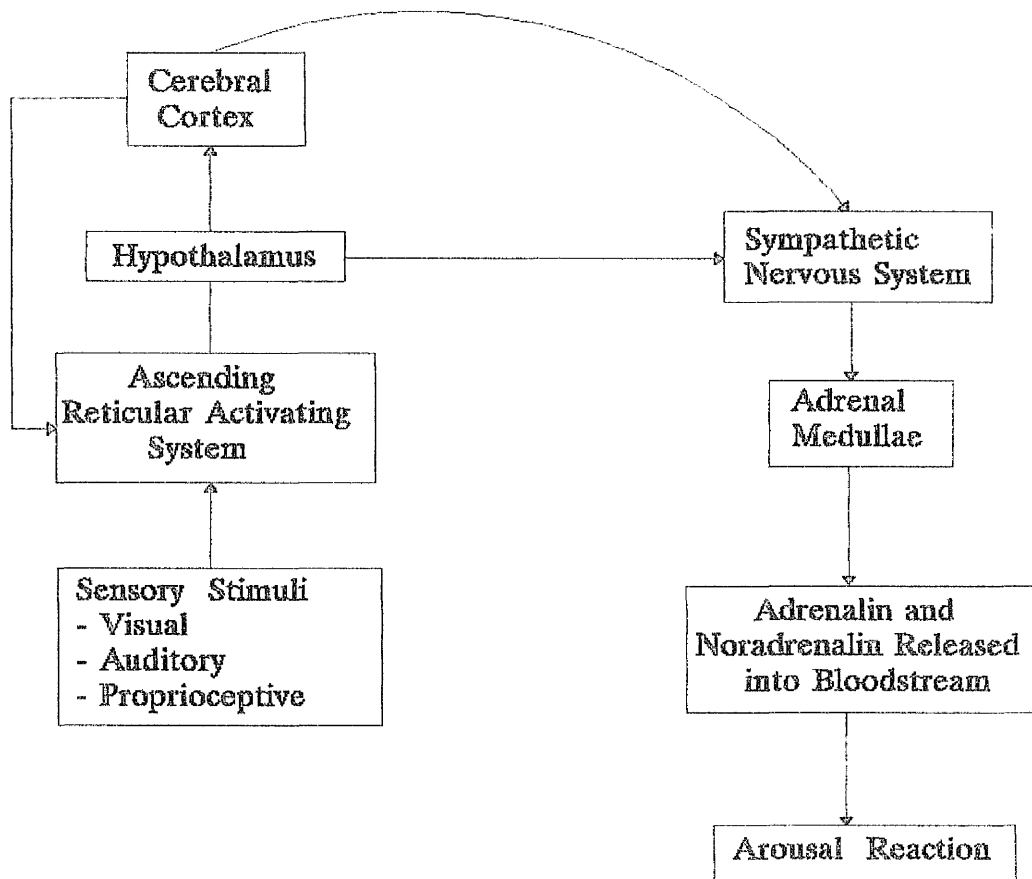


Figure A.2.1 : Simplified Illustration of the Anatomical and Physiological Basis of the Arousal Reaction (Adapted from Cox, 1990).

activation, was the overall effect of linking early research to a unidimensional theory of arousal.

An overview of the process by which the arousal reaction is generated was offered by Cox (1990) and is illustrated in Figure A.2.1. For a more detailed description of the nervous system and the brain mechanisms the reader is directed to Cox (1990), Kemper (1978), Panksepp (1989), Rosenweig and Leiman (1989), and, Tucker and Frederick (1989).

Environmental stimuli from the cerebral cortex can initiate the arousal reaction process at the level of ARAS which activates the other brain structures which in turn activate the sympathetic nervous system and as a result large quantities of catecholamines are released into the bloodstream. The organism maintains at the produced arousal state until the absorption of catecholamines from the body tissues.



## Appendix 2

The integration of these different systems in an athletic situation was demonstrated by Landers and Boutcher (1986) by means of the following example:

"A field hockey goalie sits in the dressing room minutes before an important match. She is worried about the upcoming game because she doubts her ability to play well in the biggest match of the season. These thoughts lead to anxiety about performance. Her worrying may not be realistic, but to her body, that does not matter. The cortex sends signals to the hypothalamus, which in turn releases hormones that activate the pituitary gland.... As emotional involvement increases, adrenal medullary secretion of adrenaline increases (Krahenbuhl, 1975). ..... These hormones (epinephrine and norepinephrine also called adrenaline and noradrenaline) together with increased activity of the autonomic system, prepare her body and mind for an emergency "fight or flight" situation. Heart rate, blood pressure, and breathing increase, and muscles in general begin to tighten. Blood vessels in the hands and feet close down, and their blood supply is shunted to the larger, deeper muscles. The hockey goalie is now in an overly aroused or anxious state" (p. 165).

Landers and Boutcher (1986) noted that, the athlete's initial appraisal of the situation in combination with an important event was responsible for generating worry and the starting point of a chain of reactions that is usually the first part of the arousal process<sup>2</sup> which further led to physiological reactions. Once the physiological responses start to occur (heart rate, muscle tension, brain waves, skin conductance, etc.) the athlete begins to appraise the feelings as well. If there are not coping resources available to the athlete, more worry will be created which may further be intensified once the performance begins. It becomes obvious that in the foregoing example arousal is illustrated as a unitary construct.

---

<sup>2</sup>According to Landers and Boutcher (1986), mental appraisal usually precedes the emotional reactions, but, there are cases in which mental appraisal follows the emotional reactions (e.g. in startle responses).

## Appendix 3

### APPENDIX 3

#### THE TWO-FACTOR THEORY OF SCHACHTER (1964)

The main propositions of Schachter's (1964) two-factor theory, as stated by Schachter himself are as follows:

"a) Given a state of physiological arousal for which an individual has no immediate explanation, he will "label" this state and describe his feelings in terms of the cognitions available to him. To the extent that cognitive factors are potent determinants of emotional states, it could be anticipated that precisely the same state of physiological arousal could be labeled "joy" or "fury" or any of a great diversity of emotional labels, depending on the cognitive aspects of the situation.

b) Given a state of physiological arousal for which an individual has a completely appropriate explanation, .... no evaluative needs will arise, and the individual is unlikely to label his feelings in terms of the alternative cognitions available.

c) Given the same cognitive circumstances, the individual will react emotionally or describe his feelings as emotions only to the extent that he experiences a state of physiological arousal" (p. 53).

## Appendix 4

### APPENDIX 4

#### A) STUDIES SUPPORTING THE SPECIFICITY POSITION

In Table A.4.1 studies supporting to the *ANS specificity position* are summarized.

**Table A.4.1 : Studies Supporting the ANS Specificity Theory in Anger and Fear**

| Study   | Subjects   | Emotion                              | Method  | Physiol. Parameters                           |
|---|--|--------------------------------------|---|---|
| Ax, 1953<br>(R)                                       | Human subjects<br>N = 43   | Anger<br>Fear                        | Experiment<br>Electric shock<br>threat, abuse | DBP, SCRs,<br>EMG, HR,<br>SCL, RR             |
| Schachter,<br>1957<br>(R)                             | Human subjects<br>N = 48   | Anger<br>Fear                        | Experiment                                    | EMG, SCL,<br>RR, DBP,<br>BP, HR               |
| Funkenstein<br>King &<br>Drolette,<br>1957            | Coll. students<br>& psychotic<br>patients<br>N = 69                  | Anxiety<br>anger-<br>out<br>anger-in | Experiment<br>Stress<br>inducing task         | SBP, DBR,<br>HR, BCG                          |
| Elmadjian,<br>Hope &<br>Lamson,<br>1957               | Ice hockey<br>players, boxers<br>& psychiatric<br>patients<br>N = 20 | Anger<br>Fear                        | Competition                                   | Catechol.<br>E, NE <sup>1</sup><br>reactions  |
| Cohen,<br>Silverman,<br>Waddell &<br>Zuidema,<br>1961 | Ulcer<br>patients,<br>control<br>subjects                            | Aggress.<br>Anxiety                  | FTT   | NE<br>Associat<br>with<br>Aggrss<br>reactions |
| Bronson &<br>Desjardins,<br>1971                      | mice   | Anger<br>Fear                        | Experiment                                    | E associat<br>reactions                       |
| Ekman,<br>Levenson &<br>Friesen,<br>1983<br>(R)       | Professional<br>actors<br>N = 12                                     | Anger<br>Fear<br>Sadness<br>etc.     | Imagery<br>method                             | EMG. SCL,<br>HR                               |

<sup>1</sup>NE, and E reactions were associated with specific emotion. in particular, anger (directed outward) was associated with the secretion of norepinephrine (NE), while anxiety was associated with the secretion of epinephrine (E) (Kemper, 1978).

## Appendix 4

### B) STUDIES SUPPORTING THE ANTI-SPECIFICITY POSITION

Table A.4.2 summarizes some of the studies which supported the *undifferentiated arousal theory*.

**Table A.4.2 : Studies Supporting the Anti-Specificity Theory in Anger and Fear**

| Study                                  | Subjects        | Emotion  | Method  | Physiol. Parameters             |
|--|-----------------|--|---|---------------------------------|
| Levi, 1975                             | Female subjects | Aggressive<br>Fright<br>Amusement<br>feelings          | Films   | E, NE<br>excretion              |
| Levi, 1972                             | Female subjects | Moods  | Films   | E, NE<br>excretion              |
| Patkai, 1971<br>(R)                    | Human subjects  | Pleasant.<br>Unpleasant                                | Game,<br>Psycholog. test<br>Film, Neutral<br>activity                 | E excretion                     |
| Frankenhae user & Rissler, 1970<br>(R) | Male subjects   | Anger<br>Fear  | Experiment<br>electric socks<br>Relax.<br>condition                   | E, NE<br>urinary<br>excretion   |
| Frankenhae user, 1978, 1984            | Human subjects  | Positive,<br>Negative<br>(fear)<br>affective<br>states | Playing bingo-<br>Innactivity<br>Films<br>(surgery)-<br>Tedious tests | E, NE<br>excretion              |
| Carlson, Levi, & Oro, 1972             | Human subjects  | Stress   | (Noise, light,<br>time-pressure,<br>criticism)                        | E, NE<br>associat.<br>reactions |

- SBP = Systolic Blood Pressure
- DBP = Diastolic Blood Pressure
- SCRs = Skin Conductance Responses
- SCL = Skin Conductance Level
- EMG = Electromyogram
- HR = Heart Rate
- RR = Respiration Rate
- E = Epinephrine
- NE = Norepinephrine
- BCG = Ballistocardiograph
- FTT = Focused Thematic Test (modification of TAT)
- R = Reference

## APPENDIX 5

### PRELIMINARY WORK FOR STUDY I AND STUDY II

In designing the research, a decision had to be made about the methods that could be used for achieving the purposes of the study. After evaluating the pros and cons of various qualitative and quantitative approaches and considering the demands of the research on the other, the quantitative approach, namely the self-completed questionnaire was deemed as most appropriate for this study. In addition, at the very early stage of study I, a qualitative approach, namely interviews, was also used as a means of discovering the factors which affected Greek athletes aggressive behaviour.

Once the methods had been chosen the next step was to search the aggression and anxiety literature to find out which of the existing instruments could be used for assessing athletes aggression and competitive anxiety levels. In order for an instrument to be selected it had to meet with the following criteria:

1. To be centred on sport.
2. To provide evidence of reliability and validity.
3. To be relevant to both contact and non-contact sports.

The need for using sport-specific instruments in sport psychology research had been first stressed by Brent Rushall and Gerald Kenyon (in Ostrow, 1990) in the second International Congress of Sport Psychology (1969). This fact has influenced the attitude of Sport Psychology researchers (e.g. Martens, 1977; Nitsch, 1975, cited by Hackfort and Schwenkmezger, 1989) who tend to reject methods from general psychology. Instead of borrowing global personality inventories from the field of general psychology they recommend the development of specific-instruments for questions concerning the area of sport psychology. This attitude led to a new era of sport specific instrument construction where the researchers considered how the characteristics of individuals mediate within the sport environment to elicit a behavioural response (Ostrow, 1990). Thus, non sport-specific measurements were excluded from this study.

The importance of employing valid and reliable sport-specific instruments has been addressed by Martens (1977) and others (e.g. Nideffer 1981: in Ostrow 1990). Only measures with reported evidence of their psychological properties (reliability, validity) were considered as appropriate (Standards for Educational and Psychological Testing, 1985).

The main reason for putting the third criterion was the author's view which was based on research findings that the nature of sport (contact, non-contact) could make a difference in the way athletes behave under certain circumstances. Thus, only measures that could be employed with athletes of both categories would be selected.

## Appendix 6

### APPENDIX 6

#### OPEN-ENDED QUESTIONNAIRE USED IN THE PRELIMINARY PHASE OF THE CONSTRUCTION OF THE AAI

Sex : M ... F ... Age : .....  
Sport : ..... Number of Training Years : .....

The following statements constitute a part of a preliminary research which aims to pinpoint the reasons for athletes' aggressive behaviour. These reasons might stem from the family milieu (parents, etc.), social (friends, mass media, etc.) or athletic environment (coach, administrators, etc.), personal reasons (injuries, etc.) or from some other factors that only you know. Your experience will help us to understand much better athletes' emotional state in training sessions and/or competitive situations. Your responses will be very helpful for us to understand the factors/parameters that play important role in athletes' aggressive behaviour in specific sport situations. Please give your answers as honestly as you can about:

1. The factors that make you behave aggressively :
  - a) during daily practice (pre-competitive and competitive period).
  - b) prior to competition (pre- and competitive period).
  - c) during competition (pre- and competitive period).
  - d) after competition (pre- and competitive period).
  - e) in every day life.
2. Your reactions when you are aggressive (e.g. verbal assault, physical attack, etc.).

Your cooperation is most appreciated

#### SEMI-STRUCTURED INTERVIEW SCHEDULE

- **Factual Questions:** a) Age, b) Occupation, c) Marital status, d) Education, e) Competitive experience, f) Commitment in other sport(s), and other background information (e.g. about their parents).
- Reasons for athlete's involvement in the particular sport (such as specific motives) were discussed. Most of them said that their involvement in the particular sport was due to the significant others' (e.g. P.E. teacher, friends, family members) interest or commitment in one or another way in that sport. Some others said that their involvement was a matter of chance.
- Characteristics of sport related to his/her character, nature of sport, position in the team (e.g. defensive), etc.
- Competitive status of the athlete and his/her competitive training-preparation (whether it was satisfactory or not).
- Athletes were asked to focus on sources that caused changes in their behaviour: during the daily training, prior to- during- and after competition, during both pre-competitive and competitive period, and finally in every day life. His/her relations with significant others

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(the role significant others, e.g. family members, or other individuals played as direct or indirect sources of aggression) were also discussed.

- Personal problems (such as injuries) as sources of athlete's aggression.
- Other factors-sources of athlete's aggression (e.g. from social life).
- Feelings, thoughts, reactions or intentions as being aggressor or victim and description of the particular situation.

### PARAPHRASED QUOTES OF VERBATIM TRANSCRIPTIONS

#### ATHLETE

Before, the problem was that I was inexperienced, I didn't know very well skiing, and for this reason I had problem with myself, I was angry/upset, because I wanted to learn everything in training in very short time.

I can't get over a mishap easily when interferes with my performance, makes me mad, because my opponents will have much more opportunities to succeed.

When I get nervous my anger is instant, after that it comes to an end, I calm down.

At that time, I had some personal problems, and I was very savage, rude and tough, I did things that made people to dislike me, I did not want to do any favour to anybody, I didn't want to see anybody, I wanted to be alone and even the presence of my roommate made me nervous, ... I was aggressive.

When I am carried away by my enthusiasm/excitment in the contest I become more aggressive, and this is not good for me, because the result of this is not to perform at my best level.

My mistakes make me angry with myself, because I can't believe that I did them.

Becoming aggressive it feels good.

I like to offer spectacle. The more I become aggressive the more spectacle I offer and I like it because spectators become enthusiastic/enjoy it. Thus I prefer to become aggressive even though I am able to achieve the same result without being aggressive.

When I lose I become aggressive.

I dedicate all my thoughts and energy on competition, and I am able to make anything in order to achieve the goal I put every time.

I get upset when my performance in competition is not as good as in training.

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When my training session is not successful I get angered, I feel that everything turns against me. When I am not satisfied from myself (effort), the stress that is accumulated inside me makes me feel upset and I want to burst on something.

I try to become aggressive when I compete, to wake up all my wild instincts, to give my battle and win the bar, because I compete against an inanimate thing (the bar), I should strain at on it.

I am the hot-tempered short of person, I may swear, I become provocative and I come to blows with anybody ....

I am not the aggressive short of person, I don't have tantrums, I don't come to blows with anybody and I don't have the desire to do so,... I prefer the colloquy, never to beat someone. All I want is to do my best and to be satisfied with my performance.

Injustice and ingratitude make me angry.

When I lose the victory for reasons other than my performance, I express my rage by swearing and kicking whatever I find in the locker-room.

Whether I am anxious or angry, the result is the same, I can't concentrate on what my coach says, on the strategy I must follow, I make the wrong decisions, that for sure... and it brings up more anger and nervousness.

I don't lose my temper easily now, but I used to when I was younger.

Competitive experiences, good performance and the accompied feelings are all important but what counts most, for me, is the first position, the victory and only the victory.

I found that when something goes wrong the best thing for me is not to become aggressive, to keep in check my nerves up to the point to keep myself in a safe distance from others.

Comments that prejudice an outcome irritate me, have a negative effect on me.

I try to forget my mistakes instantly, and keep them in the background, otherwise I'll get upset.

When I compete neither get angered easily nor irritated.

I rarely get angered. When I do, then, I may hit someone. I calm down quickly and perhaps for this reason thoughts of retaliation rarely cross my mind.

When something bothers me I try not to get upset, to control myself, and let it go at that,...

Untrue comments about myself provoke my verbal assault, I shout that



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this is not true, but I confine myself to this reaction only and I let others realize the misjudgement.

What characterizes me as an athlete is patience, insistence on my goals, and my ability to control my aggression.

The successfull or unsuccessful performance outcome of other athletes affects my mood accordingly (negatively or positively).

I can't stand anybody's teasing when I am not in a good mood.

I could n't compete for a time period because of my injuries, and this made me want to go for competition badly,.. I looked forward to a dynamic, aggressive game again.

I try not to listen to anybody when I compete, to keep my temper and concentrate solely on my performance.

An athlete should be aggressive if he wants others to respect him and keep them in a distance.

Everybody knows that when something irritates/annoys me then I do not behave very kindly.

I become violent when something I am interested in, saying a win, is in jeopardy, thus others are careful with me.

I always compete at my highest level in less important competitions than in crucial ones and it's very frustrating/upseting.

If something disturbs me when I compete then I am able to become verbally or physically aggressive.

I don't care if I do a foul play. What counts for me is the victory.

After a disappointing outcome I get mad for a moment, then it's over. That moment I may hit something, the floor, .. it is a motion to put away/remove the pressure I feel inside me. I may swear, not very often though, ... I calm down quickly, maybe because I am not aggressive by nature. I talk to myself, "what are you doing," the voice of sanity comes.

I make it clear to everybody that I'll be in a mood of fighting if they do something I don't like.

I can't take it easy when I lose. Even the idea that it may happen drives me mad.

You should get what you deserve by all means.

When I perform poorly I don't want to see anybody, I feel that everything is blue black, I would like to disappear not to talk to anybody.

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To play well means that you should forget all the bad things that have happened to you and concentrate on the next phase of the game. But, I do n't manage to do it always, I get upset and I feel confused.

When I was younger and inexperienced I was most interested in performing well but now I am solely interested in winning and I do whatever it takes to win.

I am upset because I can't perform at my highest level because of various personal problems. I know that my abilities can take me higher but because of the problems and the inadequate training I can't,.. it makes me furious.

When I am in a bad mood I become upset very easily, I do not like anything.

When the outcome of competition is not favorable for our team I get angered against my self and my teammates.

As an athlete I like to perform at my best level and this effort builds inside me aggression.

After competition, when my performance is poor, I feel upset and an enormous pressure on me, .. I try to calm down.

In a competition anything can happen, thus I am prepared for the good and the bad things and I don't get upset with, say, poor performance in a contest.

Though I try to be patient, I may argue with someone in training or in competition. I try, then, to avoid coming face to face with the person I argued, because I'm not sure that I'll be able to think reasonably and things may become ugly.

When I get irritated I'm not cooperative, I don't feel like doing anything and it makes things worst.

The more experienced I become the more coolly I confront competition and I feel more optimistic for my future competitions.

When I am responsible for the defeat of my team I feel guilty, the thoughts torture me, I am angry with myself, I can't feel at ease, ..

I encounter with the difficulties (injuries, etc.) by keeping my temper.

I want my performance to be stable, exceptional, and that makes me to do more than a hard play in training and in competition.

I always compare my performance with that of the best athlete and every time I compete I try to do intense and forceful play so that to bring my performance closer to that of my opponent.

Bad experiences bring dilemmas and make me bad-tempered.

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When I am not satisfied with my performance I promise (to myself) next time to onertax myself.

Comments after competition about my performance in general, and my status as an athlete get on my nerves.

When a misfortune happens to me and I can't get trained or compete, I don't become upset, I try to look at the positive aspects of the matter, I'm thinking that this is a good opportunity to get some rest that will make me able to return with more strength, energy, power and the like.

My reaction to things that anger me, whether it will be cool or violent, depends on the situation and the time that they take place.

Illness or injuries of myself make me really angry, I think constantly how far I could go (in training or competition), and I rail/curse at my bad luck.

I'm never satisfied with my performance, I want to improve it more and more and this desire drives me to try harder and harder (in training and competition), to achieve this "something more".

Every time I compete I think that this is my best day, and I am determined to get what I deserve, to make the most of it.

What I am most interested in, what is the A and the Z of my priorities is the victory, and of course the big name, and I am deternined to achieve this goal.

I regret for everything I did and affected negatively my performance, I cannot forgive myself for the way I handled the situations, for my aggressive behaviour....

Unfair comments about myself anger me.

During competition, when my performance is not as good as of my opponent I become very upset, I feel the bitterness and disappointment, everything seems black, I lose control of my thoughts and actions, I think about the concequences ..

When I compete, the only thing I think about is to win and this thought preoccupies my mind, pushes me to become more aggressive.

I like to make surprises with my performance, especially when others do not expect me to, so that to give them a hard lesson, to make them feel disappointment for their unsuccessful forecast.

In competitive situations I am usually cool-tempered.

When I compete I have a "standard" all the time in my mind which I try to reach regardless of the effort it demands and the "price" I may pay.

I love to oppose /antagonize with persons I dislike.

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I feel like bursting on something, whatever it is, when I do not perform as good as I expected in competition, I am seized with anger against myself.

My sporting experience helps me to keep under control my temper.

I accept the well-intentioned criticism without getting upset. The experienced athlete can realize whether or not the criticism to him/herself is well-intentioned.

When I compete I try to get over myself to perform exceptionally.

What first of all occupies my mind is my performance and nothing else can attract my attention.

The criticism does not upset me because helps me to realize my weaknesses and to improve myself.

When I am getting upset I swear and make a barbaric, unsportsmanlike play.

I have violent reactions when I realize that I have been unfairly treated.

The "good stuff" athlete has stomach for dirty game and pays back with the same coin.

I can't remain cool and perform well when several things are levelled against me/I am accused of.

When I am in bad mood, for instance, because of uneasy sleep, I get upset more easily and have outbursts with the slightest and trivial reason.

I do not feel sorry for the misfortune of others either teammates, that compete/fight for the same position with me, or tough-strong opponents.

I get upset when I perform poorly and I think about it all the time.

Trying to transcend myself is a sort of enragement (towards myself) demanding more and more, an aggressiveness, an exasperation/ fury that depends on the situation. For instance, as an athlete I want to do my best, and when I compete against very good athletes, trying to perform better and better, aggressiveness builds inside me.

I get very upset when I lose the victory in the last point rather than when I lose with big score difference.

When I am not satisfied with my performance, I give myself a good ticking-off/I give it to myself hot/I blow myself up after competition.

Sometimes I am rough, rude and aggressive with others.

I have violent outbursts but they are not long lasting.

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When I lose because I did n't try as hard as I could, then I don't forgive myself, I am angry with myself.

Bad/unfair criticism angers me.

I become bad-tempered when something changes in my daily schedule before competition, such as meal hours, etc..

I realize that I am more aggressive than others, selfish and nervous, because I don't want to lose neither in a friendly meeting nor in an official competition... is the stress of competition that makes me react more aggressively than other teammates ... for example, if I get a red card I get angered, all my reactions are more forceful than anybody's else but clean of deceit...

When I am getting upset I want to cause harm to living beings and inanimate things.

When I am in danger of losing a victory then I become very aggressive.

I don't care if I 'll injure seriously someone especially when he is the one who starts the fight, treads on my toes, and irritates me with his manners.

I behave aggressively in order to achieve my goals.

I am able to compete in a very rough way in order to win but only when I am not observed by the referees.

I am not the patient short of guy.

When I am irritated/angry I am looking for trouble/fight with anybody.

Sometimes, because of my personal problems I can't concentrate in competition, I get easily irritated.

### TEAMMATES

In the heat of competition I overlook at any nasty things my teammates may say or do, because I know they are under pressure and they do not mean it.

When the score is not favourable for our team, we are irritated and aggressive to each other. There have been times when my teammates made a mistake I shouted at them or when I did one they shouted at me. But we confine ourselves to arguments and gestures only, there has never been a scuffle between us.. All our reactions are instant, next day everything is all right.

I settle the disputes with my teammates after the game with discussion, keeping my voice down.

If the score of the game is bad and our nerves are on edge, I may argue with my teammates.

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I get angry with the ironic, authoritarian, flamboyant, ... manner a teammate may use to make his suggestions for something or to comment my performance.

When a teammate gives me a blow, even if it is not deliberate, I get very upset with him.

With my teammates, it depends on how close I am with each of them. If someone who is close to me says something .. I don't mind, it does n't hurt me, whereas from a teammate I dislike the least thing can make me aggressive. ... With friends you say something and then, next minute it's forgotten.

When I see that is impossible to reach an understanding with my teammate, to avoid further fighting/arguments I prefer to leave or if this is not possible to change the subject.

I go into a huff when we lose, I argue with my teammates and I make nasty thoughts about them, such as, he is an idiot, he can't do this, he can't do that, etc... and then I can't trust them any more.

If a teammate is upset, swears, and behaves badly because of his training problems I ask him to calm down, because I can't concentrate on my own training and then I' ll get upset too.

I am in very good terms with my teammates, we have an understanding, their behaviour is usually ok, we don't argue often.

I don't let myself getting upset when a teammate shouts at me because I understand that he is in a bad psychological state and, on the other hand, I don't want to lose my temper and make mistakes myself.

When my teammates don't do their best either in training or competition then I think nasty things about them.

I do not respect teammates who play poorly and I am offensive with them.

I argue with my teammates when they seem not to understand me, they don't pay the proper attention on what I say, or when we make mistakes in the game.

I feel the resentment to build inside me when other teammates who fight/ contend for the same position with me perform better than me, and I wish a misfortune for them, even an injury, so, to leave the place for me.

.... with a teammate, an old chum of mine, in our daily training, when he makes irregular movements impeding my training, I tell him to keep the distance, he doesn't. For first time is ok, for second time is ok again, the third time I get mad, I swear, shout at him,.. later, of course, I calm down. At the end of our training is like nothing's happened, we are friends again.

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When a teammate impedes my training, whether deliberately or not, I get annoyed and I may assault him, only verbally though.

When teammates or others do or say something that irritates me I get angry but my anger goes easily and I forget it quickly.

When the violation of rules by teammates or opponents affects my performance badly then I try to find a way to pay him back otherwise (if I don't) it will be in my mind all the time. If I don't say or do anything I 'll regret it later.

I am very close to my teammates and our relationship is very good. Most of my best friends are between my teammates.

When there is no excuse for my teammates' bad behaviour, for instance the pressure of the game, I won't let them off.

I don't get annoyed and upset easily when any of my teammates makes comments about my performance.

When I dislike a teammate I don't want to be on intimate terms with him/her and I can't stand comments from him; his comments irritate me.

I react violently when my team lose points because my teammate/s don't give all of their effort.

The bad psychological condition of my teammates makes me bad-tempered too.

### OPPONENTS

Many times I argue with my opponents, and I raise my voice, I assault them, verbally only, and that's it, it goes no further.

I hate to be defeated by someone I dislike. It riles me, I can't accept it easily, I think about it over and over again, how this has happened, .. To lose the victory from someone I can win hurts a lot, my pride is wounded, and I want to return it back as soon as possible, get back at him.

I felt cold, something like hatred for my opponent.

I congratulate my opponent .... I tell him about his mistakes and I try to give him something from my experience, never mind if he is opponent, what I think is, the best is gonna win.

When I lose or when my opponent makes a dangerous arm-lock, then I become a very aggressive competitor.

I don't want to hurt my opponent. Ok, I said that sometimes I may make a foul play to gain some points, but only for a bit, not to injure him.

I try to give him (opponent) the message that I'm gonna win, trying in this way to panic/scare him.

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I have no intention to retaliate on my opponent, I want only to give him a lesson (punishment) for his aggressive behaviour and make him calm down by giving him a punch.

Even if my opponent is a friend of mine, in the contest I won't hesitate to give him as hard time as I can in order to gain points.

I become aggressive when my opponent tries to panic/scare me.

A deliberate hard blow of my opponent, when he swears at me, presses me, or pinches my back angers me and I may fall on (beat) him. His posture, gestures, irony... his foul play ... provoke me. At all competitive levels there are athletes who behave in such an unsportsmanlike way.

I don't have any hatred for my opponent, I compete aggressively simply because I want to win..

When an opponent gives me a blow deliberately or by mistake I become aggressive, I assault him verbally and I may beat him.

It's beyond my comprehension, infuriates me, when an opponent of lower ability is the winner.

When my opponent gives me a hard time, I am thinking how to return it without being observed by the referees, as we say, "waiting for him (opponent) in the corner". I calm down with this thought, and I make my plans of retaliation. It is better this way than to give him a punch openly...

To get over my anxieties I must see my opponent as an hated enemy.

When an opponent overtakes me and I try to "catch" him again, sometimes it brings me out of my "pace," I get tired, frustrated, upset.

I get very upset when I lose from an opponent, particularly if I dislike him ..

When my opponent goes ahead provokes me to try harder and harder to catch or even to overtake him.

Competing with certain opponents or in play-grounds where I have bad memories is frustrating, bad thoughts cross my mind for the upcoming event and I become anxious.

When an opponent provokes me I shout and swear at him, but everything I say is directed only to him personally.

I assault my opponents or teammates verbally when they do something that hinders me from performing well only because I need to burst at someone with no intention of hurting their feelings.

My opponents make open attack on me, war of nerves to break my morals but they rarely succeed.



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When an opponent or even a teammate makes something annoying that irritates me and impedes my performance, then, I make nasty thoughts about him, I try to find something, his weak point, to hurt him... It's because of the competitive pressure.

Often my opponents attempt to make me lose my control and temper, to lose my self-confidence, with their expression and aggressive style, their manners, they make cold war on me... they sometimes succeed.

The record(s) or even the presence of my opponent makes me bad-tempered.

I know that some of my opponents hate/envy me.

I make an aggressive, forceful play trying very hard to do my best when I compete with "big names" (athletes).

To lose from an inferior opponent is unbearable, I want to get revenge, to "get the blood back".

Giving all my effort to win an opponent I may make some mistakes and this, in turn, enrages me.

To assault verbally an opponent or teammate during competition is a way to ease off/ calm down.

Many times my behaviour depends on who is my opponent, if I like him or not ... Sometimes I pretend that I like him but at the right time I'll show him my dislike.

When I am in a state of irritation I can beat my opponent ... I make foul play. But all these turn against me, because I can't control my power, is the worst way of wasting energy. At that state I am unable to control myself.

I have no intention to hurt my opponent.

I get angered when I realize that an opponent tries to hurt me psychologically by offending my beloved ones but I settle my nerves.

I believe that there is no unbeatable opponent for me and this belief gives me the strength to compete harder and harder.

When an opponent mistreats me, instead of giving up my efforts he provokes me to try harder and win.

Many times opponents say lot's of nasty things about me to upset me....They try to find my "weak points", say, about my family, my performance,.. anything that in their opinion it will hurt and upset me. They say these things loudly to hear.. But, their behaviour made me to want to try harder, to become even better, and improve my performance.

Sometimes I come to blows with my opponent.

## Appendix 6

When my opponent provokes me, offends me, then, at the right moment, I pay him back all the same and worst.

I show my dislike to my opponent during the event by inflicting psychological or physical pain to him.

When my opponent plays a dirty game, beats, then I treat him accordingly.

Injuring your opponent psychologically or physically is part of the game.

My opponents' threatening behaviour irritates me.

Many times my opponent makes a foul play (deliberate physical contact, gestures, ironical, haughty, sneering attitude, spitting, push, indecent touch, hits below the belt) that makes me furious and I want to beat him up.

I try to upset my opponent by performing at my best level.

I am enraged when an opponent threatens my physical integrity and I pay back the same.

### COACH

The most serious consequence of my mistakes is not to be among the starters of the next game. This is the worst thing that could happen to me. When, as a team, we do not bring the expected successful outcome then they (coach, administrators) impose a fine to all soccer players. I feel terrible, but I accept it, I don't argue with him because he is the coach and there will be the devil to pay when the team is not doing well. I try not to say anything at that moment, to accept whatever he says, because he is the boss of the team.

I feel upset after a disappointing competition. I avoid my coach, I do not like talking much because I am afraid that I can't help arguing with him.

Our coach pushes us to "go in and take their (opponents) heads".

When I am upset with my coach I can't bear hearing what he's saying. He asks me to stop I go on, He says black, I say white, I want to do things in my own way, to be opposed to.. Then I try to avoid him, not to talk much, ... I try to avoid any conduct with him, because I'm afraid that an explosion is gonna happen,

Sometimes coach's decisions are different from what the athlete wants. In other words, I may want to start my competitive effort (try) with x kgms, and the coach wants me to start with y kgms in order to help the team to gain points. But, all these take me out of my plan, and frustrate me ...

My coach oppose to me, dislikes me.

## Appendix 6

I get mad with my coach when he doesn't seem to share my disappointment for the competitive outcome, I want to become violent.

Two months ago I had a problem with my coach. For 6 months we didn't exchange a single word even "good morning." He was unfair to me. I believed that I deserved a better treatment and finally I was fully justified. ... It is true though that with problems like mine an athlete can't concentrate on the daily training or on competition and his/her unstable emotional state (anxiety, irritation) affects other teammates too.

My coach and team's administrators ask from us implicitly or explicitly to use any means in order to win and remain in the same category.

Sometimes I go against to my coach's will, I argue with him. What bothers me is his bad behaviour, his incompatible technical advice, his technical weaknesses and his dislike for me.

The presence of my coach in competition has a positive effect on me, and his apposite remarks enhance my self-confidence, gives me the strength to try harder.

In the contest,.. I came out and I said to my coach "there is a problem with my pistol" and he said "it's ok, go in and shoot." I expected him to realize that there is indeed a problem. Later, I had got another pistol from the federation. In one month a broke the Panhellenic record ... but I still have this bitter feeling ..

Negative comments of my coach or teammates make me moody.

I always take into consideration my coach's opinion, but, when I know that this is not exactly what I need, I try to find the middle way between what he says and what I think is the best for me to avoid arguments.

My coach's expectations are too high, so, I have to compete as hard as I can in order to prove that I am the best player and he made the right decision. But, it can be frustrating sometimes...

When my coach says something that upsets me, then I do exactly the opposite thing from what he asks me to do.

The objectionable behaviour of my coach hurts me, because during the difficult moments such as those of defeat or poor performance he doesn't support me.

My coach is by my side, understads me, and his words, even his look help me to remain cool, keep my temper.

The coach can gets on your nerves especially when, for some reason, he does n't like you. It has happened in a contest to be upset with my coach and to argue with him all the time, and the result of it was a disappointing outcome, the game lost. I remember also a teammate .. his permanent problem was the arguments with the coach..

## Appendix 6

I am in good terms with my coach, we rarely argue.

I know that my coach has personal likes and dislikes and it affects my mood.

I am afraid that I won't perform well because my coach can't give me the proper technical advice as to how I should play my opponent, and frustrates me and makes me angry.

At times my coach does not understand me, it's annoying and I can't concentrate on what I have to do.

### REFEREES

Although I know that is not the right reaction, I can't help arguing with referees for bad calls.

I become very aggressive when referees are unfair with me.

To some extent the rules allow the opposition's blows, but there are the two referees who are usually fair, they watch for dangerous, foul play and expel the misbehaving players from the game immediately.

I argue with the referees and I say to them "you ought to be ashamed of yourself; I tell you later; I score this up against you" and the like.

Usually referees rile me..

Sometimes I lose my temper with the referees's decision.

Referees are always watching so that the game is going smoothly.

The fear of referees (deprivation of the right to participate in games) is the only reason that makes me to behave myself, to keep my aggression under control.

I become very upset when I lose the victory because of bad refereing, the stupidity of referees.

Poor refereing brings always out my aggressive side.

Many times referees' biased (not fair-minded) decision infuriates me.

### SPECTATORS

In the past, the spectators' reactions and their comments, for instance, you are not playing well, etc. affected me badly. Now I feel that nobody else is in the playing ground apart from me and my teammates. But in the past their reactions could upset me, driving me to make another mistake.

It provokes/irritates me, when I make a mistake, to hear from the stads spectators yelling and swearing at me.

## Appendix 6

When a spectator or fan of the opposition tries to bring my nerves on edge, I don't listen to, snap my fingers at him, and I'm thinking next time I'll give him even harder time by improving my performance.

In an away home competition, I usually do not become upset when fans or spectators of another nationality disapprove my performance,.. on the contrary, I look like enjoy it.. Is a way to break their morals ...

When fans yell or chanting against my team I feel many times the desire to go/walk up the stands, assault them physically and make them realize with whom they have to do.

The atmosphere of disapprovement fans create for me, makes me aggressive.

Spectators applaud everybody's effort, they want to watch a good competition and all of them clap athletes' good tries and it really brings the best out of me, I play powerfully ..

I feel the anger when, during the game, spectators lash out my poor performance or my team's defeat.

When spectators swear at me, they make me very aggressive.

I remember in a match, last year, my performance was exceptional, and there were about two thousand people in the sport hall. There was a large part of spectators who swore at me constantly... Whatever I did, going to perform a servis, etc. they booed at me. In the beginning I was annoyed a bit, it was difficult for me to play well, but after a while the more they shouted down the more I performed at my best. The whole thing could affect me badly as it was the case with some of my teammates who were so annoyed/upset that they couldn't play well at all.

I get angered when the spectators swear at me or at members of my family and I can't perform well.

When I am booed by the spectators or by my opponents I don't get upset because this is a sign that I get in their hair, I am a tough opponent for them.

I drive myself very hard in competition because spectators expect me to play well, they base upon me their hopes to win and I don't want to disappoint them.

Spectators are very hostile when there is animosity between two teams and the whole atmosphere affects our behaviour negatively.

I am affected by fans' comments only when the competition is a crucial one.

A team is aroused by the enthusiasm of the crowd and the performance of the individual athlete and the team's performance as a whole improves, the game becomes more dynamic/ aggressive.

## Appendix 6

The shouts of ill-informed fans who come to sports-hall with bad mood have a bad influence on my mood as well. I feel either to prove my worth or to give up.. In both cases the effect is negative because I am not cool and calm...

It's annoying and I can't perform as good as I can when the atmosphere fans create is too tense.

When spectators behave bandly then I get upset/irritated.

The disapproval of spectators rouse me to rebellion and I become aggressive.

When fans shout at me or chanting against my team I feel a strong desire to prove my worth.

### OTHERS

When somebody bothers me I provoke him/her to a fight.

I usually have violent outbursts with the wrong doings of others, but they are not long lasting.

At that period of time I had an injury problem and a bitter feeling because my team did n't care about me. When I started playing again I tried to forget because I knew that if I keep thinking about their (administrators, and others) behaviour it will have a negative impact on my mood and my relationship with them.

When others disapprove my performance I feel bitterness.

Others' opinion always affects my mood and especially when it comes from my friendly environs.

When I perform I want to be calm. I don't want anybody to disrupt my try,.. If this happens, then, I lose my temper, I become aggressive. I start shouting or I am able to give a clout. It lasts for a few seconds, I calm down quickly.

If someone's doings upset me I assault him verbally only, nothing else, the idea/thought of beating or kicking him never crossed my mind.

I don't get annoyed with others teasing me about my performance.

If someone make comments such as "you have n't done well, I could do better than you", etc. and he is wrong, angers me.

I tolerate/ stand for my brothers criticism and comments without saying anything, but I'm getting upset and do the reverse of what I should do...

When others criticize me I feel upset, being in a tight corner, pressured.

## Appendix 6

When somebody gets on my nerves, I try to hide my feelings, though is too hard for me to hide them, because I don't want to let others know how I feel or how upset I am .....

I am interested in public opinion but I don't take it to my heart/get upset.

... the administrators' and coach's demand is to "go in and win by all means" .... win is the only thing. In every team that needs badly points these things have been said, to use unfair means, kicking, blows, etc.

Media exert influence, not on me personally, but on fans... and administrators.. when they are not well-informed about the individual players' or team's performance, then, this influence only harm can do.

Is a matter of honor for me to give a hard lesson to anybody who provokes me.

If administrators talk to me badly or they are sarcastic to me saying "you have a fine because you are late" while they know I was in trouble and it was n't my fault .. then I can't help arguing with them because they don't understand me,.. This is me, I can't change.

When I was younger I got annoyed when someone (a spectator, or another athlete's coach) watched me at the time I was performing in training or in competition.

Looking down upon someone I dislike and whose comments upset me is a way to calm down myself.

The unfair criticism of others (e.g. administrators, or people who know that I give all my effort in my training) about my performance upsets me because they should know how seriously I am involved with this sport. But, I don't give a hang for an ignorant's criticism.

If my friends make fun of my performance and ironic comments I won't take it easy, it will hurt me..

I may argue even with my parents when they say over and over again what I should do, what I haven't done in competition or in my life.

When someone provokes me I try to ignore him and keep my temper.

If a friend of mine says something that I don't like, I won't return it back to him although inside me I feel the urge to do it.

Constructive criticism is always welcomed from anybody, but, to get upset from bad criticism and nasty comments it depends on who's saying so.

When somebody disapproves my performance in order to break my moral what I think is that I'll try harder in training to improve more my performance and next time I'll give them hard time too.

## Appendix 6

When I'm getting upset, because someone said or did something to me, I feel my anger inside me like a volcano that is ready to break out .. to blow up at somebody, shouting and swearing.

I don't like fights but if somebody provokes me then I'll start fighting, I won't let it pass..

Sometimes, when I compete, I hear my friends encouraging me to try harder, and indeed my play becomes more forceful and I feel that I am able to overcome all difficulties.

When something upset me I don't keep it inside me, but I give a good ticking-off to the one who caused my anger.

If someone's behaviour upsets me, when I have him on a string I retaliate verbally or physically.

When others insult me or my beloved ones I become very aggressive both verbally and physically.

I get angered when others do not treat me fairly, or when they are not willing to see my point of view.

Many times the press is unfair and intends to support/patronize certain individuals or teams and, of course, it influences negatively my mood.

When somebody touches my pride I become aggressive, even if they are friends or my parents. When they criticize my behaviour, they don't approve my priorities, I get angered,.. I feel that this is not fair,

What angers me is when the administrators punish me for something I have never done, or when they talk to me and behave in a very nasty way.

I am not satisfied with administrators' behaviour, they ask irrational things from me and this causes problems to our relation.

I can't guarantee for my behaviour when administrators want me to be governed by their opinion and they are not interested in my own opinion or how I feel.

### COMPETITION

And only the mere thought that a crucial competition may fit in with my "bad day" upsets me.

Remarks make me aggressive. When I get two remarks (in the third I'll be forced out of the match) I have to become aggressive,.. It is in the nature of this sport, you should show that you are competing aggressively.

Competition is a means of forceful/dynamic entertainment for me, I take it as a game.



## Appendix 6

I never feel ready for a competition and this feeling sometimes frustrates and confuses me.

Competition does not mean game, relaxation, show or entertainment but only victory.

Championships is a strain, is corruption of yourself because you are going out of yourself.. you play with the maximum of your capacities ..

Competition is a dirty business and you should behave accordingly.

In an away home competition I am much more irritated and nervous because I know that the conditions are different than at home.

In the heat of competition I am not aware of my nervousness and irritation and the way I behave.

Competition irritates me, makes me tense especially at the beginning, my thinking becomes irrational. When I pass this stage then is easy to control the situation. I do not think about my opponents and I concentrate solely on my performance.

There is dirty play and in no time you can get injured ...

Competition absorbs me so much that I forget any personal or family problem and give all my effort to it.

When something goes wrong in competition I usually get very upset but only for a short time.

### ATHLETES' RESPONSES IN OPEN-ENDED-QUESTIONNAIRES

#### GENERAL - DAILY LIFE

Society force you to behave aggressively.

I am the hot-tempered short of individual. I get upset easily but I never lose my control entirely because I calm down quickly.

Serious personal or family problems.

Irrelevant remarks.

No satisfactory outcome of my efforts.

I do not try/want to put under control my aggression because expressing my anger makes me feel better.

I am usually cool and calm.

Others' doubts about my abilities make me lose my temper.

Hints from my parents, such as, I don't try as hard as can, I am the indiferent kind of person, I leave everything to chance, and generally the psychological pressure they exert on me.

I am not aggressive and resentful.

Fatigue.

Usually I do not behave aggressively.

When people try to take advantage of me.

Inpolite way of behaving.

No respect of my rights.

Fear for not being the best.

## Appendix 6

Dirty play.

Diet.

Problems with my teammates or others unrelated to athletics.

Poor performance plus irritation is equal to aggression.

Poor performance and opponents' self-confidence.

Fear for not being able to keep the first position.

Bad calls of referees.

### TRAINING

The fatigue and routine of training.

Seldom I get upset/irritated in training.

When I cannot perform at my highest level then everything irritates me,  
but it goes quickly without making something bad.

High levels of anxiety.

My teammates' bad behaviour.

No satisfactory outcome/performance in a previous game.

When my coach doesn't pay attention on me.

I behave aggressively when my coach makes remarks.

When my coach is unfair. When my teammates do not try hard enough.

When others criticise me for something I am not responsible for.

Bad behaviour of my teammates and coach.

When something goes wrong e.g. my technique, unexpected  
/unpredictable obstacles.

When I cannot perform in my way because of other people's presence.

Unfavourable criticism of my coach and no good behaviour of my  
teammates.

High levels of tense in training.

Not in mood for training.

Several things that happen before training.

Overtraining, routine of the training, injustice.

The implausible records my coach wants me to reach.

No satisfactory performance.

No verification of my expectations about performance.

I become aggressive because of the psychological doping of my coach.

Personal matters.

There is nothing that can make me behave in an aggressive manner during  
my training.

Impediment of training, extremely high demands of my coach, arguments  
with my teammates, injuries, personal problems.

Too demanding training schedule/program in combination with bad mood  
and other reasons.

Poor cooperation among teammates or with my coach.

Overly pressure from my coach.

I never behave aggressively at my teammates and coach.

Unacceptable behaviour of my teammates.

Hard pressing from my teammate.

Provocative behaviour of my teammate.

Pressure of my coach for records beyond my abilities.

When my coach humiliates me.

Indifference of teammate for successful training.

When my efforts to perform well are unsuccessful I feel disappointment  
and I react aggressively against no living things, such as balls, or  
whatever is in front of me.

The effort for performance at a higher level.

## Appendix 6

### PRIOR TO COMPETITION

Aggressive stance of opponents.  
I do not let myself carried away by my anger and get upset.  
Delay of the game (commerce).  
Unimportant reasons.  
I do not behave aggressively even when I have the chance to do so.  
Nothing can make me behave aggressively, even if others swear at me.  
When we have to win by all means.  
I never become aggressive.  
Opponent's offensive behaviour when they "smell" anxiety troubles of myself and my teammates.  
Allusions about the game.  
Injuries, annoyance/trouble of any kind.  
Wickedness of others and their prognostics about my competitive performance.  
The strong will for victory.  
Impediment of my pre-game preparation.  
I try to appear as tough as I can to reduce my anxiety on the one hand and to give a hard time to my opponent with my presence.  
My teammates' nervous behaviour.  
I become aggressive because of my anxiety.  
Unexpected matters, losing my temper because of arguments with my coach.  
Arguments with my teammates.  
Arguments with people not relevant to competition.  
Glances and provocative words of opponents.  
Glances and provocative words of teammates.  
I try to be calm.  
The pressure to win.  
Disruption of my concentration.  
Annoyance without any serious reason.  
Impediment of pre-game preparation, low level ability to concentrate, personal problems.  
The stress to perform well.  
Indifference of administrators, pieces of advice from others about the game.  
My self-confidence keeps me cool and helps me not to get irritated/upset.  
I concentrate solely on my performance.  
The anxiety and the waiting of the game.  
Pessimistic attitude or indifference of my teammates for the outcome of the game.  
Opponents' provocative behaviour.  
I don't behave aggressively because I do not want to ruin my concentration.

### DURING COMPETITION

When something is not going well in the game e.g. a shot.  
When I must eliminate aggressively an opponent.  
Foul play of opponents.  
When opponents try to hit me when they are unobserved by referees.  
Bad calls of referee.  
My teammates' mistakes affect me and I behave aggressively.  
When I try to prove to myself and others that I am a good athlete.

## Appendix 6

I behave aggressively and I don't care about anything when I am provoked by spectators or opponents.  
I do much more bad things than that opponents do. If you hit me once I'll hit you twice.  
I ignore everything that provokes me.  
My opponent get's on my nerves but I never allow to myself gut level reactions.  
I get upset/irritated during competition when spectators or others make noise that disrupts my concentration.  
When referees pretend they have n't seen my opponents' violent physical contact.  
When spectators swear at me and my teammates.  
Unjustifiable mistakes of myself.  
Unjustifiable mistakes of my teammates.  
Spectators chantings.  
When opponents swear at me and my teammates.  
When my teammates are not cooperative.  
When opponents make dirty play and the referee is not fair.  
Opponents' dirty play.  
Irrelevant remarks.  
Poor performance.  
Referees.  
Disruptions of the game and dirty play.  
When my teammates do not try their best (either we win or lose).  
Wrong doings of opponents and unfair refereeing.  
When something is not under control/goes out of my plans.  
Injustice to myself.  
When I feel that they are unfair with me I become enraged.  
Comments/criticism about my mistakes from non sport-experts.  
The effort to win.  
Referees' unfairness against me.  
Disapproval of spectators and opponents' illegitimate behaviour.  
Provocation for no reason.  
I do not behave aggressively because of the fear of punishment from referees.  
I try to be overly aggressive because I like to panic my opponent, to make him lose his hand, to manipulate him.  
Several things opponents say, and when spectators do not believe on me.  
Deliberate pushing, hitting of my teammates.  
I behave aggressively in a game only when my coach ask me to do so.  
Impedement of any kind.  
I try to be calm and in control during competition.  
Umpire's decision, my teammates' reactions.  
Others' aggressive behaviour.  
Arguments with my teammates, personal problems.  
Strong will to stand out.  
Unfair treatment from the committee of games.  
Referees' mistakes and of myself.  
Overly aggressive opponents (gestures, words), annoying comments of spectators, big mistakes of referees.  
My effort to win and especially when I see that opponents have the same attitude raises my aggressiveness.  
Inexplicable behaviour of my coach.  
Opponents' provocation.

## Appendix 6

I become aggressive when others behave aggressively to me with no reason.

Hard pressing and dirty game.

When opponents have a higher score.

Indifference and poor performance of a teammate, many and unjustifiable mistakes, my own poor performance, poor officiating.

In crucial matches I argue with opponents for delays and any kind of breaks/disruptions of the game, but never with the referee because there is the fear of the red card.

When I lose from an opponent of equal ability with me or when I try to achieve a better record.

### AFTER COMPETITION

Personal poor performance and disappointing outcome or r a n g i n g / placement of the team.

Bad outcome.

Bad behaviour of others.

Gestures of my opponents or teammates.

No satisfactory performance and my teammates (bad) behaviour for my performance.

Insults to my personality.

When others put the blame for team's bad outcome on me.

Injustice and ironic behaviour.

When the outcome of the game is unfair.

Selfish behaviour.

Things I don't like (e.g. teasing) enrage me.

When we lose.

When someone wants to be tough with me.

Opponents bad behaviour.

Hard provocation from everybody.

Violation of my rights.

My poor performance in the game.

Losing a match.

Losing a win.

Losing with small score difference from my opponent.

Bad technique and tactic, poor performance.

I did not make the game in my own way.

I feel that others take advantages of me, they insult me.

Put on me the blame for something I didn't do.

When others deprive my free choice of "movements".

When others don't do what they ask from me to do.

Talking over and over again on the same things (e.g. performance).

No satisfactory outcome.

When others behaviour is not what I expect I react aggressively.

Bad psychological state make me malicious, I take advantage of or lash out others shortcomings/weaknesses.

Injustice and criticism.

Insult of myself and of my family.

When I do not perform satisfactorily I turn my anger against myself.

Financial and other reasons.

Outcome of the game, the necessity to do well/stand out.

Failure, injuries.

No good relationship with others or with myself.

## Appendix 6

Personal pursuits/objectives and how successful they are.  
Anxiety in combination with the routine of life.  
Poor performance, discriminations, wrong people by my side, words of comfort from various people.  
Doubts about the outcome of the game.  
My coach is by my side regardless of the outcome of the game.  
Arguments when someone put me in a bad light.  
The ways some people use to put blame on .., unpolite manners.  
When the bad outcome is the result of poor officiating or of the whole teams' poor performance.  
When I feel that I have been unfairly dealt with.  
Indifference of teammates for the bad outcome.  
Provocative behaviour of referees for the bad outcome.  
When we lose I kick everything is in front of me, never teammate, or I argue with the referee for his unfair decision.  
I took issue with myself about something wrong I did.  
I try to remain cool.

### BAAGI ITEMS

- 1) My performance improves if I am provoked by my opponent.
- 2) When I get mad at my teammates, I sometimes say nasty things.
- 3) Throughout the entire athletic season, I generally maintain a constant emotional state.
- 4) I enjoy frustrating my opponent.
- 5) I generally perform better when I keep my emotions under control and concentrate solely on my performance.
- 6) Inflicting physical or psychological pain upon my opponent is necessary to achieve success.
- 7) Performing well is more important to me than the satisfaction I get from beating somebody.
- 8) It is fun to beat an opponent psychologically by teasing him/her.
- 9) It is not necessary to dislike my opponent if I am to perform at my highest level.
- 10) I am usually calm and poised before participating in an athletic event.
- 11) Injuries to myself or my teammates do not cause me to be angry with my opponent.
- 12) I have never verbally assaulted an opponent in order to hurt his/her feelings.
- 13) When an official blows a decision, I can usually accept his/her mistake without an emotional outburst.

## APPENDIX 7

### DEVELOPMENT OF THE MARLOWE-CROWNE SOCIAL DESIRABILITY SCALE

In order to generate a pool of items for the scale Crowne and Marlowe consulted a number of personality inventories. The selection criteria for inclusion which an item had to meet was:

- a) cultural approval,
- b) to be untrue for the majority of people, and
- c) have minimal pathological or abnormal implications.

A set of 50 items was circulated to a group of 10 judges which consisted of both faculty members and graduate students in the Department of Psychology for social desirability ratings. They scored each item in the socially desirability direction using true and false response categories. The resulting 47 items constituted the preliminary form of the scale.

The preliminary form of the scale was then administered to 76 students. The item analyses yielded 33 items which discriminate at the .05 level or better between high and low total scores. These 33 items constitute the final form of M-C SD scale.

Psychometric Properties of the M-C SD Scale : To determine the reliability of the scale Crowne and Marlowe (1964) employed two coefficients. First the internal coefficient of .88 was obtained by using the Kuder-Richardson formula 20. Then they administered the scale to 57 subjects on two occasions separated by one month interval. The test-retest correlation coefficient was .88. These correlations indicate that reliability was very satisfactorily achieved.

As far as validity of the M-C SD scale is concerned, evidence for content, concurrent and predictive validity were reported by the researchers (Crowne & Marlowe, 1964).

# Appendix 7

## THE MARLOWE - CROWNE SOCIAL DESIRABILITY SCALE (M-C SD)

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you personally. Then, circle the appropriate letter to the right of the statement to indicate your decision. There are no right or wrong answers. Do not spend too much time on any one statement. Your answers will be kept confidential.

- |   | True | False <sup>1</sup> |
|---|------|--------------------|
| 1. Before voting I thoroughly investigate the qualifications of all the candidates (T)***.....                                | T    | .... F             |
| 2. I never hesitate to go out of my way to help someone in trouble (T) .....  | T    | .... F             |
| 3. It is sometimes hard for me to go on with my work if I am not encouraged (F) .....   | T    | .... F             |
| 4. I have never intensely disliked anyone (T) .....   | T    | .... F             |
| 5. On occasion I have had doubts about my ability to succeed in life (F) .....  | T    | .... F             |
| 6. I sometimes feel resentful when I don't get my way (F) .....   | T    | .... F             |
| 7. I am always careful about my manner of dress.(T) ...   | T    | .... F             |
| 8. My table manners at home are as good as when I eat out in a restaurant (T) .....   | T    | .... F             |
| 9. If I could get into a movie without paying and be sure I was not seen, I would probably do it (F) ....                     | T    | .... F             |
| 10. On a few occasions, I have given up doing something because I thought too little of my ability (F) .....                  | T    | .... F             |
| 11. I like to gossip at times (F) .....   | T    | .... F             |
| 12. There have been times when I felt like rebelling against people in authority even though I knew they were right (F) ..... | T    | .... F             |
| 13. No matter who I'm talking to, I'm always a good listener (T) .....  | T    | .... F             |
| 14. I can remember "playing sick" to get out of something (F) .....   | T    | .... F             |
| 15. There have been occasions when I took advantage of someone (F) .....  | T    | .... F             |
| 16. I'm always willing to admit it when I make a mistake (T) .....  | T    | .... F             |
| 17. I always try to practice what I preach (T) .....  | T    | .... F             |
| 18. I don't find it particularly difficult to get along with loud, mouthed, obnoxious people (T) .....                        | T    | .... F             |
| 19. I sometimes try to get even, rather than forgive and forget (F) .....   | T    | .... F             |
| 20. When I don't know something I don't at all mind admitting it (T) .....  | T    | .... F             |
| 21. I am always courteous, even to people who are disagreeable (T) .....  | T    | .... F             |
| 22. At times I have really insisted on having things my own way (F) .....   | T    | .... F             |
| 23. There have been occasions when I felt like smashing   |      |                    |

<sup>1</sup> Eighteen (18) items are keyed True and 15 False.



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- things (F) ..... T .... F
24. I would never think of letting someone else be  
punished for my wrongdoings (T) ..... T .... F
25. I never resent being asked to return a favour (T) .. T .... F
26. I have never been irked when people expressed ideas  
very different from my own (T) ..... T .... F
27. I never make a long trip without checking the  
safety of my car (T) ..... T .... F
28. There have been times when I was quite jealous of  
the good fortune of others (F) ..... T .... F
29. I have almost never felt the urge to tell  
someone off (T) ..... T .... F
30. I am sometimes irritated by people who ask favours  
of me (F) ..... T .... F
31. I have never felt that I was punished without  
cause (T) ..... T .... F
32. I sometimes think when people have a misfortune  
they only got what they deserved (F) ..... T .... F
33. I have never deliberately said something that hurt  
someone's feelings (T) ..... T .... F

Your cooperation is most appreciated

# Appendix 8

## APPENDIX 8

### PILOT STUDY RESULTS OF THE ATHLETIC AGGRESSION INVENTORY (AAI)

**Table A.8.1 : Item to Subscale Correlations of the AAI Scales**  
(Pilot Study: Total Sample N = 134)

| Correlation Coefficients |            |       |             |       |           |
|--------------------------|------------|-------|-------------|-------|-----------|
| Items                    | Honest Agg | Items | Cynical Agg | Items | Angry Agg |
| 1.                       | .58        | 11.   | .53         | 24.   | .54       |
| 2.                       | .52        | 12.   | .58         | 25.   | .47       |
| 3.                       | .52        | 13.   | .64         | 26.   | .56       |
| 4.                       | .60        | 14.   | .56         | 27.   | .54       |
| 5.                       | .54        | 15.   | .55         | 28.   | .57       |
| 6.                       | .50        | 16.   | .65         | 29.   | .54       |
| 7.                       | .60        | 17.   | .69         | 30.   | .56       |
| 8.                       | .57        | 18.   | .69         | 31.   | .60       |
| 9.                       | .69        | 19.   | .66         | 32.   | .64       |
| 10.                      | .56        | 20.   | .63         | 33.   | .69       |
|                          |            | 21.   | .57         |       |           |
|                          |            | 22.   | .56         |       |           |
|                          |            | 23.   | .62         |       |           |

**Table A.8.2 : Item to Subscale Correlations of the AAI: Honest**

|       | Males  | Females | Contact | Non-Contact |
|-------|--------|---------|---------|-------------|
| Items | N = 97 | N = 37  | N = 88  | N = 46      |
| 1.    | .55**  | .61**   | .49**   | .72**       |
| 2.    | .52**  | .47**   | .50**   | .55**       |
| 3.    | .47**  | .60**   | .49**   | .61**       |
| 4.    | .57**  | .62**   | .65**   | .50**       |
| 5.    | .51**  | .58**   | .53**   | .55**       |
| 6.    | .43**  | .60**   | .49**   | .50**       |
| 7.    | .55**  | .70**   | .58**   | .65**       |
| 8.    | .53**  | .63**   | .56**   | .60**       |
| 9.    | .73**  | .65**   | .64**   | .76**       |
| 10.   | .53**  | .65**   | .52**   | .62**       |

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**Table A.8.3 : Item to Subscale Correlations of the AAI: Cynical**

|       | Males  | Females | Contact | Non-Contact |
|-------|--------|---------|---------|-------------|
| Items | N = 97 | N = 37  | N = 88  | N = 46      |
| 1.    | .52**  | .63**   | .49**   | .60**       |
| 2.    | .58**  | .62**   | .58**   | .59**       |
| 3.    | .64**  | .61**   | .70**   | .48**       |
| 4.    | .55**  | .67**   | .59**   | .54**       |
| 5.    | .64**  | .44**   | .57**   | .48**       |
| 6.    | .64**  | .63**   | .68**   | .52**       |
| 7.    | .70**  | .63**   | .71**   | .63**       |
| 8.    | .69**  | .65**   | .74**   | .56**       |
| 9.    | .64**  | .67**   | .67**   | .59**       |
| 10.   | .62**  | .65**   | .64**   | .58**       |
| 11.   | .55**  | .59**   | .65**   | .40**       |
| 12.   | .56**  | .54**   | .61**   | .64**       |
| 13.   | .65**  | .47**   | .62**   | .61**       |

**Table A.8.4 : Item to Subscale Correlations of the AAI: Angry**

|       | Males  | Females | Contact | Non-Contact |
|-------|--------|---------|---------|-------------|
| Items | N = 97 | N = 37  | N = 88  | N = 46      |
| 1.    | .56**  | .44**   | .55**   | .53**       |
| 2.    | .50**  | .43**   | .45**   | .49**       |
| 3.    | .47**  | .70**   | .57**   | .52**       |
| 4.    | .53**  | .65**   | .57**   | .55**       |
| 5.    | .56**  | .58**   | .59**   | .50**       |
| 6.    | .56**  | .47**   | .53**   | .57**       |
| 7.    | .59**  | .49**   | .59**   | .44**       |
| 8.    | .57**  | .71**   | .65**   | .51**       |
| 9.    | .67**  | .53**   | .71**   | .40**       |
| 10.   | .73**  | .54**   | .76**   | .53**       |

\*\* \_ significance level .01

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**Table A.8.5 : Reliability Coefficients of the AAI**  
(Pilot Study: Total Sample N = 134)

| AAI Scales         | Cronbach Alpha* |
|--------------------|-----------------|
| Honest Aggression  | .76             |
| Cynical Aggression | .86             |
| Angry Aggression   | .77             |

**Table A.8.6 : Reliability Coefficients of the AAI**

| AAI Scales | Cronbach Alpha* |         |        |        |        |         |
|------------|-----------------|---------|--------|--------|--------|---------|
|            | Males           | Females | C-S    | NC-S   | T-S    | I-S     |
|            | N = 97          | N = 37  | N = 88 | N = 46 | N = 24 | N = 110 |
| HAG        | .72             | .81     | .73    | .81    | .75    | .76     |
| CAG        | .86             | .85     | .88    | .80    | .82    | .86     |
| AAG        | .77             | .75     | .80    | .67    | .78    | .76     |

Reliability coefficient \* Cronbach  $\alpha > .60$  = acceptable

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Table A.8.7: Athletic Aggression Inventory Items and Factor Loadings  
(Pilot Study: Total Sample N = 134)

|                 |       |  | Factors |     |     |     |     |      |
|-----------------|-------|--|---------|-----|-----|-----|-----|------|
|                 |       |  | 1       |     | 2   |     | 3   |      |
| AAI Scales      | Items |  | VAR     | OBL | VAR | OBL | VAR | OBL. |
| 1) Honest Aggr  | 1.    |  |         |     | .58 | .58 |     |      |
|                 | 2.    |  |         |     | .51 | .51 |     |      |
|                 | 3.    |  |         |     | .51 | .51 |     |      |
|                 | 4.    |  |         |     | .58 | .58 |     |      |
|                 | 5.    |  |         |     | .57 | .57 |     |      |
|                 | 6.    |  |         |     | .46 | .46 |     |      |
|                 | 7.    |  |         |     | .56 | .56 |     |      |
|                 | 8.    |  |         |     | .55 | .55 |     |      |
|                 | 9.    |  |         |     | .73 | .73 |     |      |
|                 | 10.   |  |         |     | .59 | .58 |     |      |
| 2) Cynical Aggr | 11.   |  | .50     | .50 |     |     |     |      |
|                 | 12.   |  | .59     | .61 |     |     |     |      |
|                 | 13.   |  | .64     | .65 |     |     |     |      |
|                 | 14.   |  | .54     | .54 |     |     |     |      |
|                 | 15.   |  | .57     | .59 |     |     |     |      |
|                 | 16.   |  | .62     | .61 |     |     |     |      |
|                 | 17.   |  | .68     | .68 |     |     |     |      |
|                 | 18.   |  | .66     | .66 |     |     |     |      |
|                 | 19.   |  | .64     | .64 |     |     |     |      |
|                 | 20.   |  | .61     | .61 |     |     |     |      |
|                 | 21.   |  | .61     | .63 |     |     |     |      |
|                 | 22.   |  | .52     | .50 |     |     |     |      |
|                 | 23.   |  | .58     | .56 |     |     |     |      |
| 3) Angry Aggr   | 24.   |  |         |     |     |     | .46 | .46  |
|                 | 25.   |  |         |     |     |     | .42 | .41  |
|                 | 26.   |  |         |     |     |     | .52 | .51  |
|                 | 27.   |  |         |     |     |     | .48 | .47  |
|                 | 28.   |  |         |     |     |     | .52 | .50  |
|                 | 29.   |  |         |     |     |     | .58 | .60  |

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|     |  |     |     |
|-----|--|-----|-----|
| 30. |  | .62 | .65 |
| 31. |  | .60 | .61 |
| 32. |  | .67 | .68 |
| 33. |  | .69 | .67 |

**Table A.8.8 : Inter-Correlations of the AAI Scales**  
(Pilot Study: Total Sample N = 134)

| AAI Scales         | HAG | CAG   | AAG |
|--------------------|-----|-------|-----|
| Honest Aggression  | -   |       |     |
| Cynical Aggression | .15 | -     |     |
| Angry Aggression   | .02 | .35** | -   |

\*\* - Signif. level .01

**Table A.8.9 : Inter-Correlations of the AAI Scales**  
(Pilot Study: Total Sample N = 134)

|            |                          | Females N = 37 |       |     |
|------------|--------------------------|----------------|-------|-----|
| AAI Scales |                          | HAG            | CAG   | AAG |
| Males      | Honest Aggression (HAG)  | -              |       |     |
| N = 97     | Cynical Aggression (CAG) | .13            | -     |     |
|            | Angry Aggression (AAG)   | .06            | .45** | -   |

**Table A.8.10 : Inter-Correlations of the AAI Scales**  
(Pilot Study: Total Sample N = 134)

|            |                          | Non-Contact Sport N = 46 |       |     |
|------------|--------------------------|--------------------------|-------|-----|
| AAI Scales |                          | HAG                      | CAG   | AAG |
| Contact    | Honest Aggression (HAG)  | -                        |       |     |
| N = 88     | Cynical Aggression (CAG) | .18                      | -     |     |
|            | Angry Aggression (AAG)   | .06                      | .39** | -   |

\* - significance level .05

\*\* - significance level .01

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**Table A.8.11 : Relationship Between the AAI Scores and Scores on the Mood State Sets**  
(Pilot Study: Total Sample N = 134)

|        |                    | Mood State Set |       |       |
|--------|--------------------|----------------|-------|-------|
|        |                    | MSH            | MSC   | MSA   |
| AAI    | Honest Aggression  | .26*           |       |       |
| Scales | Cynical Aggression | .08            | .42** |       |
|        | Angry Aggression   | -.06           | .17*  | .38** |

\*\* - Signif. level .01

\* - Signif. level .05

MSH - Mood State Set for HAG

MSC - Mood State Set for CAG

MSA - Mood State Set for AAG

**Table A.8.12 : Relationship Between the AAI Responses and Coaches Evaluation**  
(Pilot Study: Total Sample N = 110)

|        |                    | Coaches Evaluation |         |        |
|--------|--------------------|--------------------|---------|--------|
|        |                    | C.H.EV.            | C.C.EV. | C.A.EV |
| AAI    | Honest Aggression  | .32**              |         |        |
| Scales | Cynical Aggression | -.00               | .23*    |        |
|        | Angry Aggression   | -.11               | .11     | .35**  |

\*\* - Signif. level .01

\* - Signif. level .05

C.H.EV. - Coaches' Evaluation for HAG

C.C.EV. - Coaches' Evaluation for CAG

C.A.EV. - Coaches' Evaluation for AAG

APPENDIX 9

THE ATHLETIC AGGRESSION INVENTORY (AAI)

Anti-Social Desirability Instructions

The highly competitive sports can create powerful feelings that make athletes think and/or behave in an manner way different than the one they use to in their every day life. The inventory you are about to complete measures how you feel during the daily training and athletic events. Sometimes athletes feel they should not admit any annoyance, aggressive tendencies, a feeling of injustice/ unfairness, extreme/ impetuous desire for winning and other feelings such as bitterness, indignation, anger, etc., because this is undesirable. Actually, these feelings as well as thoughts and/or reactions that may accompany them are quite common, and to help us understand them we want you to share your feelings with us candidly. Please, indicate on the inventory as accurately as you can if you remain cool and under control under certain circumstances. Equally, indicate with the same accuracy if you think and/or behave aggressively during the daily training and competition. Your answers will be kept strictly confidential<sup>1</sup>. We will be looking only at group responses. However, if you are interested in your own personal results and/or group findings these will be at your disposal at the end of the research.

**DIRECTIONS:** This instrument includes a number of statements which people use to describe how they feel, think and/or react in specific sport situations. Read each statement and then indicate if YOU

Strongly Agree (SA),

Agree (A),

Disagree (D),

or Strongly Disagree (SD)

with them by circling the appropriate capital letters to the right of the statement. Your decision, in each instance, should be in terms of what you believe, how you feel, or how you would react, NOT in terms of how you think you should believe, feel or respond. There are no right or wrong answers. Do not spend too much time on any one statement. Item responses should be a description of your own personal beliefs, feelings and reactions when competing in sports and games.

---

<sup>1</sup> The questionnaire you are about to complete will be used solely for scientific purposes. Except for the researcher who will analyze the data nobody else will have access to your responses. For further assurance, a sworn statement (105 law) has been filed at the law office of Mrs (Name., address., and telephone number of lawyer). Therefore, you are in a position to verify the statement.

Correspondence concerning your personal results and/or the results of the research should be addressed to researcher's address (Name., Address..).



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1. I retain my concentration at the task in hand  
even during the most critical moments of  
the game ..... SA . A . D . SD
2. I meet the unexpected aspects of a game with  
self-control and adjust to the new situation .... SA . A . D . SD
3. I always perform my best during the context  
of the game ..... SA . A . D . SD
4. I am often so absorbed by the game that  
I can't hear the spectators' approval or  
disapproval ..... SA . A . D . SD
5. When others make negative comments about  
my performance, they provoke me in order to  
try harder ..... SA . A . D . SD
6. I can judge objectively and with complete  
self-control the other athletes' actions  
during contests and training sessions ..... SA . A . D . SD
7. Usually, nothing can disturb me and make me  
lose my concentration during the contest ..... SA . A . D . SD
8. I always compete as aggressively as I am allowed  
by the game rules ..... SA . A . D . SD
9. When I enter the contest I forget everything  
and give all of myself to what I'm doing ..... SA . A . D . SD
10. Rivalry against "big names" (good athletes)  
brings out my best ..... SA . A . D . SD
11. I try to terrorize my opponent with my behaviour  
and generally with my presence ..... SA . A . D . SD
12. I have heard the expressions "get him" and  
"reduce your opponent to nothing" so many times  
that it has become part of me ..... SA . A . D . SD
13. Winning in a contest is more important than  
friendly/noble rivalry, fair play, etc ..... SA . A . D . SD
14. I try to break my opponent's morale with  
comments before the game ..... SA . A . D . SD
15. I like to frustrate my opponent ..... SA . A . D . SD
16. I would "break down/eliminate" anyone stand  
between myself and victory ..... SA . A . D . SD
17. I would rather achieve my goal than get the  
fame of the "fair play" athlete ..... SA . A . D . SD
18. Every athlete is entitled to use all means  
available in order to achieve the best result  
of him/her ..... SA . A . D . SD
19. If someone wants to achieve his targets,  
he/she should not be held back by sentimentalism  
and good manners ..... SA . A . D . SD
20. I would not hesitate to say things that could  
make my opponent panic ..... SA . A . D . SD
21. If I was sure that the referees and judges  
would not notice me, I would break the rules  
in order to win ..... SA . A . D . SD
22. I talk about my records/performance very often  
in order to scare my opponent ..... SA . A . D . SD
23. I always pay back in the same coin whoever  
tries to hinder my performance ..... SA . A . D . SD
24. When I am defeated because I am unlucky, I want

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- to express my indignation by kicking and  
hitting whatever is in front of me ..... SA . A . D . SD
25. Sometimes in moments of anger I misbehave  
towards my teammates but I regret it later ..... SA . A . D . SD
26. I am an irritable sort of person ..... SA . A . D . SD
27. I remain in a bad mood for a long time after  
a poor performance ..... SA . A . D . SD
28. Poor performance and non-fulfilment of my  
expectations for the game make me react  
violently sometimes ..... SA . A . D . SD
29. Every change of my daily routine before the  
game makes me irritable and nervous ..... SA . A . D . SD
30. Sometimes the tension before the contest is so  
severe that I feel confused ..... SA . A . D . SD
31. I become bad-tempered when I think that if  
I lose the game the opponents will laugh me  
to scorn about my performance ..... SA . A . D . SD
32. The opponent's presence next to me upsets me  
and irritates me ..... SA . A . D . SD
33. Sometimes the overtension of the game/events  
makes me think bad things about my opponent ..... SA . A . D . SD

Thank you very much for your cooperation

### SCORING the Athletic Aggression Inventory (AAI)

The AAI provides scores on three scales, Honest, Cynical, and Angry aggression. Subjects can respond to each of the 33 items on the inventory with:

- 1 = Strongly Agree (SA)
- 2 = Agree (A)
- 3 = Disagree (D)
- 4 = Strongly Disagree (SD)

No neutral middle score is provided. Scores may range from a low of 10 to a high of 40 on Honest and Angry aggression scale while for the Cynical aggression scale the score may range from a low of 13 to a high of 52. A low score indicates strong agreement with the items tapping a particular form of aggression whereas a high score indicates strong disagreement with items tapping a particular form of aggression.

## APPENDIX 10

## COMPETITIVE ANXIETY QUESTIONNAIRES

## A) SPORT COMPETITION ANXIETY TEST (SCAT)

Anti-Social Desirability Instructions

The effects of highly competitive sports can be powerful and very different among athletes. The inventory you are about to complete measures how you generally feel about competition. Please complete this inventory as honestly as you can. Sometimes athletes feel they should not admit any nervousness, anxiety, or worry about competition because this is undesirable. Actually, these feelings are quite common, and to help us understand them we want you to share your feelings with us candidly. If you are worried about the competition or have butterflies or other feelings that you know are signs of anxiety, please indicate these feelings accurately on the inventory. Similarly, if you feel calm and relaxed, indicate these feelings as accurately as you can. Your answers will not be shared with anyone. We will be looking only at group responses.

Questionnaire for Athletes

**DIRECTIONS:** Below are some statements about how persons feel when they compete in sports and games. Read each statement and decide if you *Hardly Ever*, or *Sometimes*, or *Often* feel this way when you compete in sports and games. If your choice is *Hardly Ever*, circle the letter A, if your choice is *Sometimes*, circle the letter B, and if your choice is *Often*, circle the letter C to the right of the statement. There are not right or wrong answers. Do not spend too much time on any one statement. Remember to choose the word that describes how You *usually* feel when competing in sports and games.

- |   | Hardly<br>Ever | Some-<br>times | Often |
|---|----------------|----------------|-------|
| 1. Competing against others is socially enjoyable .....                       | A              | B              | C     |
| 2. Before I compete I feel uneasy .....                                       | A              | B              | C     |
| 3. Before I compete I worry about not performing well .....                   | A              | B              | C     |
| 4. I am a good sport when I compete .....                                     | A              | B              | C     |
| 5. When I compete I worry about making mistakes .....                         | A              | B              | C     |
| 6. Before I compete I am calm .....   | A              | B              | C     |
| 7. Setting a goal is important when competing .                               | A              | B              | C     |
| 8. Before I compete I get a queasy feeling in my stomach .....                | A              | B              | C     |
| 9. Just before competing I notice my heart beats faster than usual .....      | A              | B              | C     |
| 10. I like to compete in games that demand considerable physical energy ..... | A              | B              | C     |
| 11. Before I compete I feel relaxed .....                                     | A              | B              | C     |
| 12. Before I compete I am nervous .....                                       | A              | B              | C     |

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13. Team sports are more exciting than individual sports ..... A ..... B ..... C .
14. I get nervous wanting to start the game .... A ..... B ..... C .
15. Before I compete I usually get uptight ..... A ..... B ..... C .

Thank you very much

### SCORING the Sport Competition Anxiety Test (SCAT)

The procedure for scoring SCAT is presented below. For each item one of three responses is possible: (a) Hardly ever, (b) Sometimes, and (c) Often. The 10 test items (2, 3, 5, 6, 8, 9, 11, 12, 14, and 15) are scored according to the following directions, whereas the spurious items (1, 4, 7, 10, and 13) are not scored:

- 1 = Hardly ever
- 2 = Sometimes
- 3 = Often

Scoring for items 6 and 11 is reversed according to the following key:

- 1 = Often
- 2 = Sometimes
- 3 = Hardly ever

Thus, the range of possible SCAT scores extends from 10 to 30.

### PSYCHOMETRIC PROPERTIES OF THE SPORT COMPETITION ANXIETY TEST (SCAT)

#### Psychometric Properties of the Sport Competition Anxiety Test (SCAT) :

As it has been reported by Martens (1977), the reliability of SCAT was assessed by test-retest method and through the use of analysis of variance (ANOVA). To assess the test re-test reliability of SCAT-C (Children) he took four samples (of boys and girls, Grades 5 to 6 and 8 to 9) completed the inventory. Each subject was then retested at one of the subsequent time intervals: 1 hour, 1 day, 1 week, and 1 month. Test re-test reliability was ranged from .57 to .93 with a mean of .77 for all subjects compiled. To obtain another estimate of reliability, ANOVA procedures were employed as they outlined by Kerlinger (1964; in Nie, Hull, Jenkins, Steinbrenner & Bent, 1975) (Table A.10.1).

Responses of both the samples used to assess test re-test reliability and from a sample of 153 male and female university students were employed. The mean ANOVA reliability coefficient of SCAT-C for the combined samples was higher ( $r = .81$ ) than the one obtained through test re-test procedures whereas the ANOVA reliability coefficient for SCAT-A (Adults) was even higher ( $r = .85$ ).

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<sup>1</sup>SCAT-C was modified for use with adult subjects by a) modifying the instructions so that they were appropriate for adults and b) changing one word on one item (number 8 on the inventory).

# Appendix 10

**Table A.10.1 : Reliability Coefficients Through ANOVA for the SCAT-C**  
(Adapted from Martens, 1977)

| Sample     | 1 hour | 1 day | 1 week | 1 month | Combined |
|------------|--------|-------|--------|---------|----------|
| Grades 5-6 |        |       |        |         |          |
| Males      | .81    | .79   | .71    | .81     | .78      |
| Females    | .80    | .73   | .79    | .68     | .75      |
| Grades 8-9 |        |       |        |         |          |
| Males      | .89    | .80   | .83    | .84     | .84      |
| Females    | .87    | .89   | .87    | .89     | .88      |
| Combined   | .84    | .80   | .80    | .80     | .81      |

Evidence concerning the validity of the questionnaire has also reported by Martens (1977) in detail. The concurrent validity of SCAT was examined by investigating the relationship between SCAT and general A-trait inventories (e.g. the Trait Anxiety Inventory for Adults (TAI), (Spielberger et al., 1973), etc.) and selected personality inventories (e.g. High School Personality Questionnaire (HSPQ) (Cattell & Cattell, 1969), the Fear of Negative Evaluation Scale (FNE) (Watson & Friend, 1969), etc.) (cited by Martens, 1977). Construct validity was assessed in 11 experimental and field studies. The accumulated evidence firmly supports both the concurrent and construct validity of SCAT.

## PILOT STUDY RESULTS OF THE GREEK VERSION OF THE SPORT COMPETITION ANXIETY TEST (SCAT)

**Table A.10.2 : Item to Total Correlations and Reliability Coefficient of the Greek Version of the SCAT**  
(Pilot Study N = 266)

| Correlation Coefficients |     |     |     |     |     |     |     |     |     |     |
|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Items:                   | 2   | 3   | 5   | 6   | 8   | 9   | 11  | 12  | 14  | 15  |
| SCAT :                   | .72 | .65 | .57 | .72 | .65 | .66 | .57 | .77 | .51 | .76 |

Reliability coefficient : Cronbach Alpha = .85

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## COMPETITIVE ANXIETY QUESTIONNAIRES

## B) COMPETITIVE STATE ANXIETY INVENTORY-2 (CSAI - 2)

Anti-Social Desirability Instructions

Are exactly the same with the instructions given in Appendix 10 for the SCAT except from the phrase: The inventory you are about to complete measures how you feel about this competition *at the moment* you are responding.

Questionnaire for Athletes

**DIRECTIONS :** A number of statements that athletes have used to describe their feelings before competition are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right now - at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement, but choose the answer which describes your feelings right now.

|     |   | Not At<br>All | Moderately<br>Somewhat | Very<br>So | Much<br>So |
|-----|---|---------------|------------------------|------------|------------|
| 1.  | I am concerned about this competition .....                               | 1             | 2                      | 3          | 4          |
| 2.  | I feel nervous .....  | 1             | 2                      | 3          | 4          |
| 3.  | I feel at ease .....  | 1             | 2                      | 3          | 4          |
| 4.  | I have self-doubts .....  | 1             | 2                      | 3          | 4          |
| 5.  | I feel jittery .....  | 1             | 2                      | 3          | 4          |
| 6.  | I feel comfortable .....  | 1             | 2                      | 3          | 4          |
| 7.  | I am concerned that I may not do as well in this competition as I could . | 1             | 2                      | 3          | 4          |
| 8.  | My body feels tense .....   | 1             | 2                      | 3          | 4          |
| 9.  | I feel self-confident .....   | 1             | 2                      | 3          | 4          |
| 10. | I am concerned about losing .....   | 1             | 2                      | 3          | 4          |
| 11. | I feel tense in my stomach .....  | 1             | 2                      | 3          | 4          |
| 12. | I feel secure .....   | 1             | 2                      | 3          | 4          |
| 13. | I am concerned about choking under pressure .....                         | 1             | 2                      | 3          | 4          |
| 14. | My body feels relaxed .....   | 1             | 2                      | 3          | 4          |
| 15. | I'm confident I can meet the challenge .....                              | 1             | 2                      | 3          | 4          |
| 16. | I'm concerned about performing poorly .....                               | 1             | 2                      | 3          | 4          |
| 17. | My heart is racing .....  | 1             | 2                      | 3          | 4          |
| 18. | I'm confident about performing well .                                     | 1             | 2                      | 3          | 4          |
| 19. | I'm concerned about reaching my goal.                                     | 1             | 2                      | 3          | 4          |
| 20. | I feel my stomach sinking .....   | 1             | 2                      | 3          | 4          |
| 21. | I feel mentally relaxed .....   | 1             | 2                      | 3          | 4          |
| 22. | I'm concerned that others will be disappointed with my performance ....   | 1             | 2                      | 3          | 4          |

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23. My hands are clammy ..... 1 ..... 2 ..... 3 ..... 4  
 24. I'm confident because I mentally  
 picture myself reaching my goal ..... 1 ..... 2 ..... 3 ..... 4  
 25. I'm concerned I won't be able to  
 concentrate ..... 1 ..... 2 ..... 3 ..... 4  
 26. My body feels tight ..... 1 ..... 2 ..... 3 ..... 4  
 27. I'm confident of coming through  
 under pressure ..... 1 ..... 2 ..... 3 ..... 4

Thank you very much for your cooperation

### SCORING the Greek Version of the Competitive State Anxiety Inventory-2

The Greek version of the CSAI-2 is scored by computing a separate total for each of the three subscales, with scores ranging from a low of 7 to a high of 28 for both cognitive A-state and self-confidence, and from a low of 9 to a high of 36 for somatic A-state. The higher the score, the greater the cognitive or somatic A-state or the greater the state self-confidence. No total score for the inventory is computed.

The cognitive A-state subscale is scored by totaling the responses for the following 7 items: 1, 7, 10, 16, 19, 22, and 25. The somatic A-state subscale is scored by adding the responses to the following 9 items: 2, 5, 8, 11, 14R, 17, 20, 23, and 26. Scoring for item 14 must be reversed in calculating the score for the somatic A-state subscale as indicated below:

- 1 = 4  
 2 = 3  
 3 = 2  
 4 = 1

The state self-confidence subscale is scored by adding the following 7 items: 9, 12, 15, 18, 21, 24, and 27.

### PSYCHOMETRIC PROPERTIES OF THE COMPETITIVE STATE ANXIETY INVENTORY-2

Psychometric Properties of the Competitive State Anxiety Inventory-2 (CSAI-2) : Test- retest reliability is inappropriate for state scales, thus the method used by Martens et al. (1990) for estimating reliability was by examining the internal consistency. Data from three samples were used and separate Cronbach's alpha coefficients were computed for the three CSAI-2 subscales for each sample. Alpha coefficients ranged from .79 to .90. They are shown in Table A.11.1.

**Table A.11.1 : Internal Consistency of the CSAI-2 Subscales**  
 (Adapted from Martens, Vealey & Burton, 1990)

| Sample | N  | CSAI-cog | CSAI-som | CSAI-sc |
|--------|----|----------|----------|---------|
| 1      | 57 | .79      | .82      | .88     |
| 2      | 40 | .83      | .82      | .89     |
| 3      | 54 | .81      | .83      | .90     |

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Insofar as the validity of the inventory is concerned, evidence for both concurrent and construct validity were presented by Martens et al. (1990). The concurrent validity of the CSAI-2 was examined by investigating the relationships between each of the CSAI-2 subscales and eight selected A-trait and A-state inventories. The results revealed that the coefficients were highly congruent with hypothesized relationships among CSAI-2 subscales and scales of related constructs. As regards the construct validity of the CSAI-2 as a measure of sport specific A-state (cognitive, somatic, and self-confidence) accumulated supporting evidence was provided through a systematic progression of research studies.

### 2nd PILOT STUDY RESULTS OF THE GREEK VERSION OF THE COMPETITIVE STATE ANXIETY INVENTORY-2

**Table A.11.2 : Item to Total Correlation Coefficients of the Greek Version of the CSAI-2 Subscales**  
(2nd Pilot Study N = 106)

| Item Number | A-Cognitive | Item Number | A-Somatic | Item Number | Self-Conf |
|-------------|-------------|-------------|-----------|-------------|-----------|
| 1.          | .57         | 2.          | .64       | 3.          | .62       |
| 4.          | .70         | 5.          | .63       | 6.          | .69       |
| 7.          | .69         | 8.          | .56       | 9.          | .79       |
| 10.         | .65         | 11.         | .65       | 12.         | .78       |
| 13.         | .58         | 14.         | .37       | 15.         | .67       |
| 16.         | .74         | 17.         | .71       | 18.         | .73       |
| 19.         | .69         | 20.         | .61       | 21.         | .64       |
| 22.         | .76         | 23.         | .47       | 24.         | .70       |
| 25.         | .61         | 26.         | .68       | 27.         | .74       |

**Table A.11.3 : Reliability Coefficients of the CSAI-2 Subscales**  
(2nd Pilot Study N = 106)

| CSAI-2 Scales         | Cronbach Alpha |
|-----------------------|----------------|
| Cognitive A-state     | .84            |
| Somatic A-state       | .77            |
| State Self-Confidence | .87            |



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**Table A.11.4 : Factor Analysis Results of the CSAI-2  
(2nd Pilot Study N = 106)**

| Items           |     | FACTORS         |      |             |     |           |     |
|-----------------|-----|-----------------|------|-------------|-----|-----------|-----|
|                 |     | Self-Confidence |      | A-Cognitive |     | A-Somatic |     |
|                 |     | VAR             | OBL  | VAR         | OBL | VAR       | OBL |
| 1.              | C   | -               | -    | .50         | .55 | -         | -   |
| 2.              | S   | -               | -    | -           | -   | .38       | .46 |
| 3.              | S-C | .53             | .58  | -           | -   | -         | -   |
| 4.              | C   | -               | -    | .68         | .70 | -         | -   |
| 5.              | S   | -               | -    | .56         | .65 | -         | -   |
| 6.              | S-C | .62             | .67  | -           | -   | -         | -   |
| 7.              | C   | -               | -    | .66         | .69 | -         | -   |
| 8.              | S   | -               | -    | -           | -   | .42       | .47 |
| 9.              | S-C | .82             | .81  | -           | -   | -         | -   |
| 10.             | C   | -               | -    | .71         | .69 | -         | -   |
| 11.             | S   | -               | -    | -           | -   | .75       | .75 |
| 12.             | S-C | .77             | .78  | -           | -   | -         | -   |
| 13.             | C   | -               | -    | -           | -   | .39       | .47 |
| 14.             | S   | -.54            | -.54 | -           | -   | -         | -   |
| 15.             | S-C | .67             | .68  | -           | -   | -         | -   |
| 16.             | C   | -               | -    | .69         | .72 | -         | -   |
| 17.             | S   | -               | -    | -           | -   | .71       | .74 |
| 18.             | S-C | .74             | .75  | -           | -   | -         | -   |
| 19.             | C   | -               | -    | .70         | .71 | -         | -   |
| 20.             | S   | -               | -    | -           | -   | .79       | .76 |
| 21.             | S-C | .55             | .60  | -           | -   | -         | -   |
| 22.             | C   | -               | -    | .74         | .75 | -         | -   |
| 23.             | S   | -               | -    | -           | -   | .42       | .46 |
| 24.             | S-C | .65             | .68  | -           | -   | -         | -   |
| 25.             | C   | -               | -    | .57         | .61 | -         | -   |
| 26.             | S   | -               | -    | -           | -   | .65       | .70 |
| 27.             | S-C | .73             | .74  | -           | -   | -         | -   |
| PCT of variance |     | 28.3            |      | 11.5        |     | 7.7       |     |

## APPENDIX 12

## SCREENING OF DATA

A set of issues that examines whether the underlying assumptions of the analyses are met should be considered before running any analysis. This is especially the case when multivariate methods are concerned. In particular, the assumptions which were checked for the analyses performed in this study are presented in Table A.12.1 (Tabachnick & Fidell, 1989).

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**Table A.12.1 : Checklist for Screening Data**

---

- |    |   |
|----|---|
| 1. | Inspect univariate descriptive statistics for accuracy of input |
| 2. | Evaluate amount and distribution of missing data                |
| 3. | Identify non-normal variables (skewness, kurtosis)              |
| 4. | Identify outliers   |
| 5. | Check for nonlinearity and heteroscedasticity                   |
| 6. | Evaluate variables for multicollinearity and singularity        |
| 7  | Homogeneity of variance - covariance matrices                   |
- 

These will be described in some detail below.

**Accuracy of Input:** The first step for screening of data was to examine descriptive statistics for plausibility of means, standard deviations, and values of variables. Inspection of data indicated that some variables were out of their normal range. This was found to be due to the false entry of data in the computer. To identify and correct these cases, descriptive statistics for the three data sets had to be run for at least four times. Finally, all values of variables were found to be within the expected range.

**Missing Data:** A few missing values were identified to all (3) data sets. But, since the data sets were large and the pattern of missing points random, there was not a serious problem. The SPSS computer program handled this problem by replacing missing values with mean scores which were calculated using available responses. Although by using this procedure the variance of the variable is reduced, the loss in this case was not serious since only a very small amount of data was missing (Tabachnick & Fidell, 1989).

**Normality:** This assumption requires that each variable used in the analysis is normally distributed. If this assumption is met, then the residuals of analysis are also normally distributed. Statistically, there are two components to normality, skewness and kurtosis. A skewed distribution departs from the bell-shaped curve of the normal distribution in either the upper or lower parts of the distribution. A common measure for this is the skewness coefficient (Y3). For a normal

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distribution,  $Y3 = 0$ . As a convenient rule of thumb for samples of 20 to 100 observations, a benchmark for suspecting positive skewness is  $Y3 > +.5$ , whereas for negative skewness is  $Y3 < -.5$ . With regard to kurtosis, a common test for normality is to compare the sample distribution in the tails with the distribution under the theoretical normal distribution. The statistic used in this comparison is the kurtosis coefficient ( $Y4$ ). The kurtosis coefficient provides evidence on whether the distribution is more or less fat-tailed than would be expected from the normal distribution. For a normal distribution,  $Y4 = 0$ . A benchmark for suspecting violations from normality is  $Y4 < -1$  or  $Y4 > +1$  (Foster, 1986).

In order to assess normality, frequency histograms were employed along with skewness and kurtosis values. Careful inspection of the histograms revealed that all variables of the three data sets were normally distributed with non significant skewness and kurtosis with one exception, that is somatic anxiety. With regard to this variable, the visual appearance of the distribution seemed to depart from the bell-shaped curve of the normal distribution. However, in a large sample, a variable with significant skewness and/ or kurtosis, does not deviate enough from normality so that to make a realistic difference in the analysis (Tabachnick & Fidell, 1989). Lewis (1968) also, after reviewing several empirical studies that have been made for examining the effects of violations of this assumption, concluded that the F test is robust "unless the departure from normality in the groups sampled is seen to be extreme" (p. 45). Since the sample size used in this study was larger than 100 observations, and on the other hand the departure from normality was not extreme, the researcher felt that no severe violation of this assumption was present.

**Linearity:** The assumption of linearity is that there is a straight line relationship between two variables. Linearity is fundamental to multivariate statistics because only linear relationships among variables are analyzed and, therefore, violation of this assumption implies that the model fails to capture the systematic pattern of relationship between the dependent and independent variables (Fox, 1991). Linearity was diagnosed from bivariate scatterplots between pairs of variables, as well as by the residuals scatterplots through SPSS REGRESSION. However, assessing linearity through bivariate scatterplots between all the possible pairs of variables can be an endless procedure. Thus, only the pairs of "main importance" variables as well as of those were suspected to have true nonlinearity were examined. Inspection of the residual scatterplots revealed that, although the linear relationship between some variables was not a perfect one, there was no severe departure from linearity and thus no violation was evident.

**Homoscedasticity:** This assumption requires that the variability in scores for one variable is roughly the same at all values of the other variable (Tabachnick & Fidell, 1989). When the assumption of normality is met, then the relationships between variables are homoscedastic and predictability is added to the analysis.

**Outliers:** Outliers are cases with extreme values on one variable

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(univariate outliers) or a combination of variables (multivariate outliers) which influence statistical analyses by producing either a Type I or a Type II error. Univariate outliers are usually detected by means of graphical methods such as histograms. An outlier is a case which seems to be unattached to the rest of the distribution. Two cases were found to have extreme values on the honest aggression variable. These cases were deleted from further analysis. Multivariate outliers can be identified by using the statistical method of Mahalanobis distance. Multiple regressions were performed for the total sample as well as for each category separately. These analyses revealed the presence of a number of outliers. To identify the variables responsible for the outlying cases, a new variable (dummy grouping variable) was created where the outliers had a value of one and the rest of the cases a value of zero. The regression analyses performed with the dummy variable as the dependent one revealed that variables, such as occupation, marital status, were the ones creating the majority of outlying cases. Since these variables were not of a crucial importance for the analyses, it was decided to delete them from further analysis. There were, however, about 15 outliers scattered in the rest of the variables (this number varies from file to file and from category to category). Deletion from the category these cases belonged to was the strategy adopted.

**Multi-collinearity and Singularity:** Multi-collinearity occurs when the correlation coefficients among independent variables is near .90 or above, whereas with singularity there is a perfect correlation of variables and one of the variables is a combination of one or more of the other variables. To check for multi-collinearity and singularity the SMCs (squared multiple correlation) of the variables were inspected in the factor analysis correlation matrix (Tabachnick & Fidell, 1989). Measures of collinearity were also employed for each category through the SPSS REGRESSION procedure. A preliminary inspection revealed that neither multi-collinearity nor singularity was evident.

**Homogeneity of Variance-Covariance Matrices:** This assumption requires that "variance-covariance matrices within each cell of the design are sampled from the same population variance-covariance matrix and can reasonably be pooled to create a single estimate of error. If the within-cell error matrices are heterogeneous, the pooled matrix is misleading as an estimate of error variance" (Tabachnick & Fidell, 1989) (p. 379). To test homogeneity, Box's M test was employed for all MANOVA analyses. Inspection of the results showed that Box's M was not significant at  $p < .01$  for the vast majority of the analyses performed.

## APPENDIX 13

## DESCRIPTIVE STATISTICS

The sports which comprised each sport category are shown in Table A.13.1.

**Table A.13.1 : Sports Included in Each Sport Category**

|    | Team Contact | Team Non-Contact | Individual Contact | Individual Non-Contact |
|----|--------------|------------------|--------------------|------------------------|
| 1. | Handball     | Volleyball       | Wrestling          | Swimming               |
| 2. | Basketball   |                  | Boxing             | Weight-Lifting         |
| 3. | Water-Polo   |                  |                    |                        |

## MEANS AND STANDARD DEVIATIONS

Below the means (M) and standard deviations (SD) for the whole sample, males, females, contact, non-contact, team and individual sport categories in each of the three instruments are presented.

## The Athletic Aggression Inventory (AAI)

**Table A.13.2 : Means and Standard Deviations for the Athletic Aggression Inventory (AAI)**

| N = 840  | Honest Aggr |      | Cynical Aggr |      | Angry Aggr |      |
|----------|-------------|------|--------------|------|------------|------|
|          | M           | SD   | M            | SD   | M          | SD   |
| All      | 16.29       | 3.70 | 35.59        | 6.69 | 25.47      | 4.77 |
| Males    | 15.83       | 3.62 | 34.95        | 6.71 | 25.58      | 4.76 |
| Females  | 17.20       | 3.70 | 36.87        | 6.45 | 25.25      | 4.77 |
| Contact  | 16.04       | 3.43 | 34.32        | 6.59 | 25.08      | 4.72 |
| Non-Cont | 16.56       | 3.48 | 37.19        | 6.53 | 25.94      | 4.80 |
| Team     | 16.23       | 3.59 | 34.76        | 6.51 | 25.39      | 4.59 |
| Individ  | 16.41       | 3.84 | 36.72        | 6.86 | 25.61      | 4.97 |

# Appendix 13

## The Sport Competition Anxiety Test (SCAT)

**Table A.13.3 : Means and Standard Deviations for the Sport Competition Anxiety Test (SCAT)**

| Sport Competition Anxiety Test |       |       |       |       |       |       |       |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|
| N=853                          | All   | Males | Femal | C-S   | NC-S  | T-S   | I-S   |
| M :                            | 20.05 | 19.22 | 21.69 | 19.87 | 20.25 | 19.36 | 20.84 |
| SD :                           | 4.80  | 4.51  | 4.92  | 4.50  | 5.10  | 4.68  | 4.81  |

## The Competitive State Anxiety Inventory - 2 (CSAI-2)

**Table A.13.4 : Means and Standard Deviations for the Competitive State Anxiety Inventory - 2 (CSAI-2)**

| N = 831  | A-Cognitive |      | A-Somatic |      | Self-Confidence |      |
|----------|-------------|------|-----------|------|-----------------|------|
|          | M           | SD   | M         | SD   | M               | SD   |
| All      | 15.20       | 4.40 | 16.78     | 5.01 | 21.33           | 4.34 |
| Males    | 14.82       | 4.40 | 16.39     | 4.87 | 21.86           | 4.19 |
| Females  | 15.92       | 4.32 | 17.52     | 5.18 | 20.32           | 4.46 |
| Contact  | 15.87       | 4.79 | 16.79     | 4.78 | 21.64           | 4.14 |
| Non-Cont | 15.81       | 4.58 | 16.76     | 5.35 | 20.98           | 4.52 |
| Team     | 15.59       | 4.54 | 15.70     | 4.52 | 22.15           | 4.04 |
| Individ  | 16.10       | 4.83 | 17.96     | 5.23 | 20.41           | 4.49 |

**Table A.13.5 : Means and Standard Deviations for the Competitive State Anxiety Inventory - 2 (CSAI-2)**

| N = 610  | A-Cognitive |      | A-Somatic |      | Self-Confidence |      |
|----------|-------------|------|-----------|------|-----------------|------|
|          | M           | SD   | M         | SD   | M               | SD   |
| All      | 15.85       | 4.82 | 16.90     | 5.16 | 21.48           | 4.41 |
| Males    | 15.52       | 4.92 | 16.48     | 5.05 | 22.06           | 4.20 |
| Females  | 16.49       | 4.59 | 17.67     | 5.27 | 20.41           | 4.59 |
| Contact  | 16.04       | 5.01 | 17.15     | 4.94 | 21.76           | 4.29 |
| Non-Cont | 15.67       | 4.66 | 16.67     | 5.37 | 21.25           | 4.52 |
| Team     | 15.64       | 4.75 | 15.91     | 4.87 | 22.43           | 4.07 |
| Individ  | 16.11       | 4.91 | 18.07     | 5.24 | 20.45           | 4.55 |

Appendix 13

The Sample Size of the SCAT and CSAI-2 Measures Across Categories

Table A.13.6 : The Sample Size for the Two Instruments  
SCAT & CSAI-2  
Completed by Athletes Across Sport Categories

|                          |   | SCAT | CSAI-2 |
|--------------------------|---|------|--------|
| Total Sample (All)       | : | 853  | 610    |
| Males                    | : | 566  | 394    |
| Females                  | : | 287  | 216    |
| Contact Sport (C-S)      | : | 449  | 320    |
| Non-Contact Sport (NC-S) | : | 404  | 304    |
| Team Sport (T-S)         | : | 453  | 328    |
| Individual Sport (I-S)   | : | 392  | 292    |

# Appendix 14

## APPENDIX 14

### MAIN STUDY RESULTS OF THE PSYCHOMETRIC PROPERTIES OF THE ATHLETIC AGGRESSION INVENTORY (AAI)

**Table A.14.1 : Item to Subscale Correlation of the AAI**  
(Main study: Total Sample N = 840)

| Correlation Coefficients |             |       |              |       |            |
|--------------------------|-------------|-------|--------------|-------|------------|
| Items                    | Honest Aggr | Items | Cynical Aggr | Items | Angry Aggr |
| 1.                       | .60         | 11.   | .60          | 24.   | .51        |
| 2.                       | .45         | 12.   | .51          | 25.   | .46        |
| 3.                       | .50         | 13.   | .54          | 26.   | .54        |
| 4.                       | .49         | 14.   | .52          | 27.   | .49        |
| 5.                       | .44         | 15.   | .57          | 28.   | .61        |
| 6.                       | .40         | 16.   | .64          | 29.   | .46        |
| 7.                       | .63         | 17.   | .55          | 30.   | .46        |
| 8.                       | .51         | 18.   | .58          | 31.   | .53        |
| 9.                       | .66         | 19.   | .45          | 32.   | .47        |
| 10.                      | .49         | 20.   | .58          | 33.   | .53        |
|                          |             | 21.   | .52          |       |            |
|                          |             | 22.   | .40          |       |            |
|                          |             | 23.   | .47          |       |            |

**Table A.14.2 : Item to Subscale Correlations of the AAI: *Honest***

| Items | Males   | Females | Contact | Non-Contact |
|-------|---------|---------|---------|-------------|
|       | N = 558 | N = 282 | N = 446 | N = 401     |
| 1.    | .56**   | .64**   | .56**   | .63**       |
| 2.    | .63**   | .59**   | .60**   | .64**       |
| 3.    | .50**   | .48**   | .51**   | .50**       |
| 4.    | .47**   | .56**   | .50**   | .52**       |
| 5.    | .46**   | .53**   | .44**   | .55**       |
| 6.    | .38**   | .45**   | .39**   | .44**       |
| 7.    | .48**   | .52**   | .48**   | .50**       |
| 8.    | .44**   | .44**   | .38**   | .51**       |
| 9.    | .64**   | .65**   | .62**   | .68**       |
| 10.   | .43**   | .46**   | .42**   | .48**       |



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Table A.14.3 : Item to Subscale Correlations of the AAI: *Cynical*

|       | Males   | Females | Contact | Non-Contact |
|-------|---------|---------|---------|-------------|
| Items | N = 558 | N = 282 | N = 446 | N = 401     |
| 11.   | .54**   | .50**   | .49**   | .57**       |
| 12.   | .57**   | .61**   | .53**   | .60**       |
| 13.   | .58**   | .54**   | .58**   | .54**       |
| 14.   | .50**   | .53**   | .48**   | .51**       |
| 15.   | .57**   | .65**   | .50**   | .63**       |
| 16.   | .53**   | .50**   | .51**   | .55**       |
| 17.   | .62**   | .69**   | .67**   | .62**       |
| 18.   | .60**   | .62**   | .56**   | .66**       |
| 19.   | .51**   | .60**   | .55**   | .52**       |
| 20.   | .48**   | .46**   | .53**   | .39**       |
| 21.   | .38**   | .40**   | .42**   | .42**       |
| 22.   | .44**   | .47**   | .47**   | .47**       |
| 23.   | .52**   | .49**   | .54**   | .44**       |

Table A.14.4 : Item to Subscale Correlations of the AAI: *Angry*

|       | Males   | Females | Contact | Non-Contact |
|-------|---------|---------|---------|-------------|
| Items | N = 558 | N = 282 | N = 446 | N = 401     |
| 24.   | .45**   | .50**   | .45**   | .49**       |
| 25.   | .42**   | .54**   | .50**   | .41**       |
| 26.   | .47**   | .48**   | .45**   | .51**       |
| 27.   | .53**   | .51**   | .54**   | .51**       |
| 28.   | .46**   | .47**   | .43**   | .50**       |
| 29.   | .59**   | .64**   | .62**   | .59**       |
| 30.   | .51**   | .57**   | .53**   | .54**       |
| 31.   | .53**   | .54**   | .51**   | .54**       |
| 32.   | .49**   | .48**   | .45**   | .52**       |
| 33.   | .50**   | .53**   | .51**   | .52**       |

\*\* - Signif. LE .01

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**Table A.14.5 : Reliability Coefficients of the AAI**  
(Main study N = 840)

| AAI Scales         | Cronbach Alpha |
|--------------------|----------------|
| Honest Aggression  | .69            |
| Cynical Aggression | .79            |
| Angry Aggression   | .67            |

**Table A.14.6 : Reliability Coefficients of the AAI**

| Cronbach's Alpha Reliability Coefficients * |         |         |         |          |         |         |
|---|---------|---------|---------|----------|---------|---------|
|   | Males   | Females | Contact | Non-Cont | Individ | Team    |
| AAi   | N = 558 | N = 282 | N = 446 | N = 401  | N = 453 | N = 394 |
| HAG   | .66     | .72     | .64     | .73      | .71     | .67     |
| CAG   | .78     | .80     | .78     | .79      | .80     | .79     |
| AAG   | .65     | .71     | .66     | .69      | .67     | .69     |

Reliability coefficient

\*Cronbach  $\alpha > .60$  acceptable

**Table A.14.7 : Factor Analysis Results of the AAI**  
(Main study N = 840)

| AAI Scales     | Items | Rotation |     |      |      |     |     |
|----------------|-------|----------|-----|------|------|-----|-----|
|                |       | VAR      | OBL | VAR  | OBL  | VAR | OBL |
| 1. Honest Aggr | 1     |          |     |      |      | .59 | .60 |
|                | 2     |          |     | -.45 | -.45 | .37 | .39 |
|                | 3     |          |     |      |      | .46 | .46 |
|                | 4     |          |     |      |      | .47 | .47 |
|                | 5     |          |     |      |      | .43 | .42 |
|                | 6     |          |     |      |      | .34 | .35 |
|                | 7     |          |     |      |      | .66 | .66 |
|                | 8     |          |     |      |      | .49 | .49 |
|                | 9     |          |     |      |      | .70 | .71 |
|                | 10    |          |     |      |      | .50 | .49 |

## Appendix 14

|                 |    |      |     |     |     |
|-----------------|----|------|-----|-----|-----|
| 2. Cynical Aggr | 11 | .55  | .59 |     |     |
|                 | 12 | .46  | .49 |     |     |
|                 | 13 | .58  | .57 |     |     |
|                 | 14 | .52  | .53 |     |     |
|                 | 15 | .55  | .58 |     |     |
|                 | 16 | .59  | .63 |     |     |
|                 | 17 | .59  | .57 |     |     |
|                 | 18 | .61  | .59 |     |     |
|                 | 19 | .41  | .42 |     |     |
|                 | 20 | .57  | .58 |     |     |
|                 | 21 | .52  | .52 |     |     |
|                 | 22 | .33  | .35 |     |     |
|                 | 23 | .38  | .42 |     |     |
| 3. Angry Aggr   | 24 |      |     | .56 | .56 |
|                 | 25 |      |     | .41 | .40 |
|                 | 26 |      |     | .47 | .50 |
|                 | 27 |      |     | .45 | .45 |
|                 | 28 |      |     | .60 | .62 |
|                 | 29 |      |     | .41 | .40 |
|                 | 30 |      |     | .40 | .40 |
|                 | 31 |      |     | .51 | .51 |
|                 | 32 |      |     | .40 | .41 |
|                 | 33 |      |     | .46 | .50 |
| PCT of variance |    | 14.4 |     | 9.5 | 5.6 |

No Factor loadings of the items of any aggression type exceeded the value of .30 on the other two Factors unless where indicated.

## APPENDIX 15

## MAIN STUDY RESULTS

## MULTIVARIATE AND UNIVARIATE ANALYSES OF VARIANCE OF THE ATHLETIC TYPES OF AGGRESSION

Differences in Types of Aggression Among Athletes of Different Sport Categories

Table A.15.1 : Tests of Sport Category for the Total Sample with Athletic Types of Aggression : Summary Findings+

| Cat | Aggr    | Univariate |       | Stepdown |       | Sig F |
|-----|---------|------------|-------|----------|-------|-------|
|     |         | F          | DF    | F        | DF    |       |
| All | Honest  | 1.78       | 3/836 | 1.17     | 3/834 | .321  |
|     | Cynical | 16.71      | 3/836 | 16.71*** | 3/836 | .000  |
|     | Angry   | 2.98       | 3/836 | .82      | 3/835 | .483  |

Signif. Level : \*p&lt;.05    \*\*p&lt;.01    \*\*\*p&lt;.001

+ Note that the sample of individual contact sport is comprised only of male subjects.

Table A.15.2 : Univariate Analyses of Variance of the Athletic Types of Aggression (DV) for Effects of Sport Category (IV)

Effect .. Sport Category  
Univariate F-tests : Summary Findings

|     | Honest |      |      | Cynical |      | Angry |      |
|-----|--------|------|------|---------|------|-------|------|
|     | DF     | F    | SF   | F       | SF   | F     | SF   |
| All | 3/836  | 1.78 | .149 | 16.71   | .000 | 2.98  | .031 |

Gender Differences in Athletes' Types of Aggression**Table A.15.3 : Tests of Gender with the Athletic Aggression Types:  
Summary Findings**

| GENDER<br>IV | Aggr (DV) | Univariate |       | StepDown |       | Sig F        |
|--------------|-----------|------------|-------|----------|-------|--------------|
|              |           | F          | DF    | F        | DF    |              |
| All          | HAG       | 29.64      | 1/838 | 29.64*** | 1/838 | .000         |
|              | CAG       | 15.86      | 1/838 | 12.24*** | 1/837 | .000         |
|              | AAG       | .90        | 1/838 | 4.13*    | 1/836 | <u>.042</u>  |
| Contact      | HAG       | 6.23       | 1/444 | 6.23*    | 1/444 | .013         |
|              | CAG       | 3.23       | 1/444 | 2.68     | 1/443 | .102         |
|              | AAG       | .10        | 1/444 | .07      | 1/442 | .786         |
| Non-Contact  | HAG       | 20.68      | 1/399 | 20.68*** | 1/399 | .000         |
|              | CAG       | 5.78       | 1/399 | 8.65**   | 1/397 | .003         |
|              | AAG       | 7.10       | 1/399 | 4.18*    | 1/398 | .042         |
| Team         | HAG       | 10.01      | 1/451 | 10.01**  | 1/451 | .002         |
|              | CAG       | 1.59       | 1/451 | 1.14     | 1/450 | .287         |
|              | AAG       | 1.16       | 1/451 | 1.84     | 1/449 | .175         |
| Individual   | HAG       | 23.73      | 1/392 | 18.12*** | 1/391 | .000         |
|              | CAG       | 35.41      | 1/392 | 35.41*** | 1/392 | .000         |
|              | AAG       | .30        | 1/392 | 5.78*    | 1/390 | <u>.017*</u> |

Signif. Level : \*p&lt;.05    \*\*p&lt;.01    \*\*\*p&lt;.001

\* Significant only in Stepdown

Appendix 15

Table A.15.4 : Univariate Analyses of Variance of the Athletic  
Types of Aggression (DVs) for Effects of Gender (IV)

EFFECT .. Gender

Univariate F-tests: Summary Findings

|          | Honest |        |      | Cynical |      | Angry |      |
|----------|--------|--------|------|---------|------|-------|------|
|          | DF     | F      | SF   | F       | SF   | F     | SF   |
| All      | 1/838  | 29.643 | .000 | 15.861  | .000 | .900  | .343 |
| Contact  | 1/444  | 6.230  | .013 | 3.230   | .073 | .096  | .756 |
| Non-Cont | 1/399  | 20.679 | .000 | 5.782   | .017 | 7.096 | .008 |
| Team     | 1/451  | 10.013 | .002 | 1.594   | .207 | 1.163 | .281 |
| Individ  | 1/392  | 23.730 | .000 | 35.409  | .000 | .302  | .583 |

## Appendix 16

### APPENDIX 16

#### MAIN STUDY RESULTS OF THE GREEK VERSION OF THE SPORT COMPETITION ANXIETY TEST (SCAT)

##### PSYCHOMETRIC PROPERTIES OF THE GREEK VERSION OF THE SCAT

**Table A.16.1 :** Item to Total Correlation of the Greek Version of the Sport Competition Anxiety Test (SCAT)  
(Main study N = 853)

| Correlation Coefficients |     |     |     |     |     |     |     |     |     |     |
|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                          | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
| SCAT :                   | .73 | .67 | .54 | .72 | .71 | .67 | .56 | .72 | .56 | .77 |

Cronbach Alpha : .86

**Table A.16.2 :** Factor Analysis Results of the Greek Version of the Sport Competition Anxiety Test (SCAT)  
(Main study N = 853)

| SCAT Items      | Factor matrix |
|-----------------|---------------|
| 1.              | .75           |
| 2.              | .68           |
| 3.              | .52           |
| 4.              | .73           |
| 5.              | .72           |
| 6.              | .67           |
| 7.              | .55           |
| 8.              | .73           |
| 9.              | .53           |
| 10.             | .78           |
| PCT of variance | 44.9          |

# Appendix 17

## APPENDIX 17

### MAIN STUDY RESULTS OF THE GREEK VERSION OF THE COMPETITIVE STATE ANXIETY INVENTORY-2 (CSAI-2)

#### PSYCHOMETRIC PROPERTIES OF THE GREEK VERSION OF THE CSAI-2

**Table A.17.1 (a,b,c) : Item to Total Correlation of the Greek Version of the CSAI-2**  
(Main study N = 831)

**Table A.17.1 (a)**

| Items       | 1   | 7   | 10  | 16  | 19  | 22  | 25  |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| A-Cognitive | .59 | .74 | .69 | .73 | .70 | .73 | .60 |

**Table A.17.1 (b)**

| Items     | 2   | 5   | 8   | 11  | 14  | 17  | 20  | 23  | 26  |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| A-Somatic | .64 | .66 | .67 | .67 | .50 | .72 | .61 | .52 | .73 |

**Table A.17.1 (c)**

| Items       | 9   | 12  | 15  | 18  | 21  | 24  | 27  |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| Self-Confid | .73 | .66 | .69 | .72 | .64 | .69 | .69 |

**Table A.17.2 : Reliability Coefficients of the Greek Version of the CSAI-2**  
(Main study N = 831)

| CSAI-2 Scales     | Cronbach alpha |
|-------------------|----------------|
| A - Cognitive     | .81            |
| A - Somatic       | .81            |
| Self - confidence | .81            |



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**Table A.17.3 : Factor Analyses Results of the Greek Version of the Competitive State Anxiety Inventory-2 (CSAI-2)**  
(Main study N = 831)

| A-Cognitive |      |      | A-Somatic |      |      | Self-Confidence |      |      |
|-------------|------|------|-----------|------|------|-----------------|------|------|
| Items       | Var. | Obl. | Items     | Var. | Obl. | Items           | Var. | Obl. |
| 1.          | .53  | .58  | 2.        | .56  | .63  | 9.              | .70  | .73  |
| 7.          | .68  | .73  | 5.        | .57  | .64  | 12.             | .50  | .57  |
| 10.         | .67  | .70  | 8.        | .67  | .67  | 15.             | .69  | .71  |
| 16.         | .68  | .74  | 11.       | .64  | .69  | 18.             | .74  | .75  |
| 19.         | .70  | .71  | 14.       | .45  | .45  | 21.             | .55  | .59  |
| 22.         | .70  | .72  | 17.       | .67  | .71  | 24.             | .69  | .70  |
| 25.         | .45  | .53  | 20.       | .56  | .61  | 27.             | .70  | .72  |
|             |      |      | 23.       | .48  | .49  |                 |      |      |
|             |      |      | 26.       | .72  | .75  |                 |      |      |
| PCT of var  | 9.5  |      |           | 29.4 |      |                 | 7.1  |      |

**MULTIVARIATE AND UNIVARIATE ANALYSES OF VARIANCE OF THE GREEK VERSION OF THE COMPETITIVE STATE ANXIETY INVENTORY-2 (CSAI-2)**

**Differences in Competitive A-State among Athletes due to Sport Category**

**Table A.17.4 : Tests of Sport Category for the Total Sample with the Three Subscales of CSAI-2: Summary Findings**

| SPORT CAT<br>IV | A-State (DV) | Univariate |       | Stepdown |       | Sig F |
|-----------------|--------------|------------|-------|----------|-------|-------|
|                 |              | F          | DF    | F        | DF    |       |
| All             | A-Cognitive  | 1.22       | 3/606 | 4.13     | 3/604 | .006  |
|                 | A-Somatic    | 11.02      | 3/606 | 5.17**   | 3/605 | .002  |
|                 | Self-Confid  | 11.70      | 3/606 | 11.70*** | 3/606 | .000  |

Signif. Level : \*p<.05    \*\*p<.01    \*\*\*p<.001

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**Table A.17.5 : Univariate Analyses of Variance of the Components of CSAI-2 (DVs) for Effects of Sport Category (IV)**

| Effect .. Sport Category              |             |      |      |           |      |                 |      |
|---------------------------------------|-------------|------|------|-----------|------|-----------------|------|
| Univariate F-tests : Summary Findings |             |      |      |           |      |                 |      |
|                                       | A-Cognitive |      |      | A-Somatic |      | Self-confidence |      |
|                                       | DF          | F    | SF   | F         | SF   | F               | SF   |
| All                                   | 3/606       | 1.22 | .302 | 11.02     | .000 | 11.70           | .000 |

**Gender Differences in Competitive A-State**

**Table A.17.6 : Tests of Gender with the Components of CSAI-2: Summary Findings**

| Gender IV   | A-State DV | Univariate F | DF    | Stepdown F | DF    | Sig F |
|-------------|------------|--------------|-------|------------|-------|-------|
| All         | A-Cog      | 5.14         | 1/608 | .02        | 1/606 | .895  |
|             | A-Som      | 7.54         | 1/608 | .50        | 1/607 | .478  |
|             | S-Conf     | 20.10        | 1/608 | 20.10***   | 1/608 | .000  |
| Contact     | A-Cog      | .03          | 1/318 | .44        | 1/317 | .507  |
|             | A-Som      | .00          | 1/318 | .00        | 1/316 | .962  |
|             | S-Conf     | .59          | 1/318 | .59        | 1/318 | .442  |
| Non-Contact | A-Cog      | 12.60        | 1/302 | 1.40       | 1/300 | .237  |
|             | A-Som      | 12.79        | 1/302 | 1.52       | 1/301 | .218  |
|             | S-Conf     | 26.33        | 1/302 | 26.33***   | 1/302 | .000  |
| Team        | A-Cog      | .67          | 1/326 | 5.50*      | 1/324 | .020  |
|             | A-Som      | 11.42        | 1/326 | 3.76       | 1/325 | .054  |
|             | S-Conf     | 12.57        | 1/326 | 12.57***   | 1/326 | .000  |
| Individual  | A-Cog      | 7.38         | 1/290 | 1.30       | 1/289 | .255  |
|             | A-Som      | 1.87         | 1/290 | 1.21       | 1/288 | .272  |
|             | S-Conf     | 18.11        | 1/290 | 18.11***   | 1/290 | .000  |

Signif. Level : \*p<.05      \*\*p<.01      \*\*\*p<.001

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**Table A.17.7 : Univariate Analyses of Variance of the Components of CSAI-2 (DVs) for Effects of Gender (IV)**

| Effect .. Gender                      |             |        |      |           |      |                 |      |
|---------------------------------------|-------------|--------|------|-----------|------|-----------------|------|
| Univariate F-tests : Summary Findings |             |        |      |           |      |                 |      |
|                                       | A-Cognitive |        |      | A-Somatic |      | Self-Confidence |      |
|                                       | DF          | F      | SF   | F         | SF   | F               | SF   |
| All                                   | 1/608       | 5.140  | .024 | 7.539     | .006 | 20.095          | .000 |
| Contact                               | 1/318       | .031   | .858 | .000      | .981 | .593            | .442 |
| Non-Cont                              | 1/302       | 12.604 | .000 | 12.786    | .000 | 26.327          | .000 |
| Team                                  | 1/326       | .673   | .412 | 11.416    | .001 | 12.572          | .000 |
| Individ                               | 1/290       | 7.379  | .007 | 1.867     | .173 | 18.114          | .000 |

## Appendix 18

### APPENDIX 18

#### MAIN STUDY RESULTS

#### REGRESSION ANALYSES

The variables which revealed a significant effect from the regression analyses are presented below.

A) Regression Analyses for the Athletic Types of Aggression (AAI) and Competitive A-Trait (SCAT)

**Table A.18.1** Regression Analyses Across All Categories For the Honest Aggression with A-Trait as IV or Vice Versa

| Cat | DV | Var Pred | Mult R | Rsq | Adj R sq | Beta | F     | Sig F |
|-----|----|----------|--------|-----|----------|------|-------|-------|
| All | H  | SCAT     | .33    | .11 | .10      | .33  | 70.48 | .000  |
| Mal | H  | SCAT     | .25    | .06 | .06      | .25  | 26.37 | .000  |
| Fem | H  | SCAT     | .39    | .15 | .15      | .39  | 36.50 | .000  |
| C-S | SC | H        | .20    | .04 | .04      | .20  | 12.79 | .000  |
| N-C | SC | H        | .42    | .18 | .17      | .42  | 60.99 | .000  |
| T-S | H  | SCAT     | .30    | .09 | .09      | .30  | 32.60 | .000  |
| I-S | H  | SCAT     | .34    | .12 | .11      | .34  | 35.84 | .000  |

**Table A.18.2** Regression Analyses Across All Categories for the Cynical Aggression with A-Trait as IV or Vice Versa

| Cat | DV | Var Pred | Mult R | Rsq | Adj R sq | Beta | F    | Sig F |
|-----|----|----------|--------|-----|----------|------|------|-------|
| All | C  | SCAT     | .00    | .00 | -.00     | -.00 | .01  | .920  |
| Mal | C  | SCAT     | .16    | .02 | .02      | -.16 | 9.58 | .002  |
| Fem | C  | SCAT     | .18    | .03 | .03      | .18  | 6.83 | .010  |
| C-S | SC | C        | .05    | .00 | -.00     | -.05 | .66  | .416  |
| N-C | C  | SCAT     | .03    | .00 | -.00     | .03  | .20  | .654  |
| T-S | C  | SCAT     | .09    | .01 | .00      | -.09 | 2.51 | .114  |
| I-S | C  | SCAT     | .05    | .00 | -.00     | .05  | .59  | .442  |

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**Table A.18.3** Regression Analyses Across All Categories for the Angry Aggression with A-Trait as IV or Vice Versa

| Cat | DV | Var Pred | Mult R | Rsqr | Adj R sq | Beta | F      | Sig F |
|-----|----|----------|--------|------|----------|------|--------|-------|
| All | A  | SCAT     | .42    | .17  | .17      | -.42 | 126.17 | .000  |
| Mal | A  | SCAT     | .44    | .19  | .19      | -.44 | 92.05  | .000  |
| Fem | SC | A        | .38    | .14  | .14      | -.38 | 35.18  | .000  |
| C-S | SC | A        | .42    | .18  | .18      | -.42 | 67.79  | .000  |
| N-C | SC | A        | .42    | .18  | .17      | -.42 | 61.07  | .000  |
| T-S | A  | SCAT     | .45    | .20  | .20      | -.45 | 81.76  | .000  |
| I-S | A  | SCAT     | .39    | .15  | .15      | -.39 | 49.27  | .000  |

B) Regression Analyses for the Competitive A-State (CSAI-2) with Aggression Types (AAI) as the Independent Variable

**Table A.18.4** Regression Analyses Across All Categories for the A-Cognitive with Honest Aggression (IV)

| Cat | DV  | Var Pred | Mult R | Rsqr | Adj R sq | Beta | F    | Sig F |
|-----|-----|----------|--------|------|----------|------|------|-------|
| All | COG | H        | .11    | .01  | .01      | .11  | 7.31 | .007  |
| Mal | COG | H        | .08    | .01  | .00      | .08  | 2.57 | .110  |
| Fem | COG | H        | .13    | .02  | .01      | .13  | 3.60 | .059  |
| C-S | COG | H        | .17    | .03  | .02      | .17  | 8.73 | .003  |
| N-C | COG | H        | .07    | .00  | .00      | .07  | 1.42 | .234  |
| T-S | COG | H        | .07    | .00  | .00      | .07  | 1.59 | .208  |
| I-S | COG | H        | .15    | .02  | .02      | .15  | 6.14 | .014  |

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**Table A.18.5** Regression Analyses Across All Categories for the A-Somatic with Honest Aggression (IV)

| Cat | DV  | Var Pred | Mult R | Rsqr | Adj R sq | Beta | F     | Sig F |
|-----|-----|----------|--------|------|----------|------|-------|-------|
| All | SOM | H        | .13    | .02  | .02      | .13  | 10.41 | .001  |
| Mal | SOM | H        | .08    | .01  | .00      | .08  | 2.50  | .115  |
| Fem | SOM | H        | .19    | .03  | .03      | .19  | 7.37  | .007  |
| C-S | SOM | H        | .15    | .03  | .02      | .15  | 7.39  | .007  |
| N-C | SOM | H        | .12    | .02  | .01      | .12  | 4.51  | .035  |
| T-S | SOM | H        | .12    | .01  | .01      | .12  | 4.76  | .030  |
| I-S | SOM | H        | .13    | .02  | .01      | .13  | 4.46  | .036  |

**Table A.18.6** Regression Analyses Across All Categories for the Self-Confidence with Honest Aggression (IV)

| Cat | DV  | Var Pred | Mult R | Rsqr | Adj R sq | Beta | F      | Sig F |
|-----|-----|----------|--------|------|----------|------|--------|-------|
| All | S-C | H        | .41    | .17  | .17      | -.41 | 120.78 | .000  |
| Mal | S-C | H        | .39    | .15  | .15      | -.39 | 67.97  | .000  |
| Fem | S-C | H        | .41    | .17  | .16      | -.41 | 41.41  | .000  |
| C-S | S-C | H        | .32    | .10  | .10      | -.32 | 35.90  | .000  |
| N-C | S-C | H        | .48    | .23  | .23      | -.48 | 86.12  | .000  |
| T-S | S-C | H        | .41    | .17  | .16      | -.41 | 64.52  | .000  |
| I-S | S-C | H        | .42    | .17  | .17      | -.42 | 55.98  | .000  |

**Table A.18.7** Regression Analyses Across All Categories for the A-Cognitive with Cynical Aggression (IV)

| Cat | DV  | Var Pred | Mult R | Rsqr | Adj R sq | Beta | F    | Sig F |
|-----|-----|----------|--------|------|----------|------|------|-------|
| All | COG | C        | .05    | .00  | .00      | -.05 | 1.78 | .183  |
| Mal | COG | C        | .14    | .02  | .02      | -.14 | 7.38 | .007  |
| Fem | COG | C        | .07    | .01  | .00      | .07  | 1.11 | .294  |
| C-S | COG | C        | .03    | .00  | -.00     | -.03 | .32  | .573  |
| N-C | COG | C        | .06    | .00  | .00      | -.06 | 1.09 | .298  |
| T-S | COG | C        | .10    | .01  | .01      | -.10 | 3.18 | .075  |
| I-S | COG | C        | .02    | .00  | -.00     | -.02 | .11  | .745  |

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**Table A.18.8** Regression Analyses Across All Categories for the A-Somatic with Cynical Aggression (IV)

| Cat | DV  | Var Pred | Mult R | Rsqr | Adj R sq | Beta | F    | Sig F |
|-----|-----|----------|--------|------|----------|------|------|-------|
| All | SOM | C        | .06    | .00  | .00      | -.06 | 2.27 | .133  |
| Mal | SOM | C        | .15    | .02  | .02      | -.15 | 8.86 | .003  |
| C-S | SOM | C        | .04    | .00  | -.00     | -.04 | .46  | .500  |
| N-C | SOM | C        | .07    | .00  | .00      | -.07 | 1.25 | .265  |
| T-S | SOM | C        | .10    | .01  | .01      | -.10 | 3.14 | .077  |
| I-S | SOM | C        | .08    | .01  | .00      | -.08 | 1.85 | .175  |

**Table A.18.9** Regression Analyses Across All Categories for the Self-Confidence with Cynical Aggression (IV)

| Cat | DV  | Var Pred | Mult R | Rsqr | Adj R sq | Beta | F    | Sig F |
|-----|-----|----------|--------|------|----------|------|------|-------|
| All | S-C | C        | .07    | .01  | .00      | -.07 | 3.11 | .079  |
| Mal | S-C | C        | .00    | .00  | .00      | .00  | .00  | .980  |
| Fem | S-C | C        | .14    | .02  | .02      | -.14 | 4.19 | .042  |
| C-S | S-C | C        | .04    | .00  | -.00     | -.04 | .46  | .498  |
| N-C | S-C | C        | .09    | .01  | .00      | -.09 | 2.12 | .146  |
| T-S | S-C | C        | .01    | .00  | -.00     | -.01 | .07  | .795  |
| I-S | S-C | C        | .07    | .01  | .00      | -.07 | 1.45 | .229  |

**Table A.18.10** Regression Analyses Across All Categories for the A-Cognitive with Angry Aggression (IV)

| Cat | DV  | Var Pred | Mult R | Rsqr | Adj R sq | Beta | F     | Sig F |
|-----|-----|----------|--------|------|----------|------|-------|-------|
| All | COG | A        | .27    | .07  | .07      | -.27 | 47.60 | .000  |
| Mal | COG | A        | .28    | .08  | .08      | -.28 | 33.83 | .000  |
| Fem | COG | A        | .24    | .06  | .05      | -.24 | 12.61 | .000  |
| C-S | COG | A        | .25    | .06  | .06      | -.25 | 20.45 | .000  |
| N-C | COG | A        | .29    | .09  | .08      | -.29 | 26.63 | .000  |
| T-S | COG | A        | .25    | .06  | .06      | -.25 | 21.19 | .000  |
| I-S | COG | A        | .30    | .09  | .09      | -.30 | 26.25 | .000  |

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**Table A.18.11** Regression Analyses Across All Categories for the A-Somatic with Angry Aggression (IV)

| Cat | DV  | Var Pred | Mult R | Rsqr | Adj R sq | Beta | F     | Sig F |
|-----|-----|----------|--------|------|----------|------|-------|-------|
| All | SOM | A        | .28    | .08  | .08      | -.28 | 51.41 | .000  |
| Mal | SOM | A        | .28    | .08  | .08      | -.28 | 33.43 | .000  |
| Fem | SOM | A        | .27    | .07  | .07      | -.27 | 16.64 | .000  |
| C-S | SOM | A        | .27    | .08  | .07      | -.27 | 25.03 | .000  |
| N-C | SOM | A        | .28    | .08  | .08      | -.28 | 24.88 | .000  |
| T-S | SOM | A        | .27    | .07  | .07      | -.27 | 26.21 | .000  |
| I-S | SOM | A        | .30    | .09  | .09      | -.30 | 26.56 | .000  |

**Table A.18.12** Regression Analyses Across All Categories for the Self-Confidence with Angry Aggression (IV)

| Cat | DV  | Var Pred | Mult R | Rsqr | Adj R sq | Beta | F     | Sig F |
|-----|-----|----------|--------|------|----------|------|-------|-------|
| All | S-C | A        | .17    | .03  | .03      | .17  | 17.82 | .000  |
| Mal | S-C | A        | .12    | .02  | .01      | .12  | 6.09  | .014  |
| Fem | S-C | A        | .24    | .06  | .05      | .24  | 12.28 | .001  |
| C-S | S-C | A        | .16    | .03  | .02      | .16  | 8.22  | .004  |
| N-C | S-C | A        | .19    | .04  | .03      | .19  | 10.87 | .001  |
| T-S | S-C | A        | .20    | .04  | .04      | .20  | 13.30 | .000  |
| I-S | S-C | A        | .15    | .02  | .02      | .15  | 6.11  | .014  |



## APPENDIX 19

## MAIN STUDY RESULTS

## REGRESSION PLOTS RESULTS : NON-SIGNIFICANT RESULTS OF SCAT WITH AAI

Table A.19.1 : The Competitive A-Trait with the Athletic Types of Aggression

| No Relationship           |             |       |         |         |
|---------------------------|-------------|-------|---------|---------|
| Pairs of Variables        | Category    | Slope | Interc* | Correl+ |
| Cynical Aggr with A-Trait | All         | -.006 | 35.51   | -.004   |
|                           | Contact     | -.031 | 21.12   | -.046   |
|                           | Non-Contact | .035  | 36.11   | .027    |
|                           | Team        | -.126 | 37.06   | -.087   |
|                           | Individual  | .066  | 34.95   | .049    |

\* Intercept

+ Correlation

## REGRESSION PLOTS RESULTS : NON-SIGNIFICANT RESULTS OF AAI WITH CSAI-2

Table A.19.2 : Athletic Types of Aggression with the Competitive A-State

| No Relationship                         |             |       |        |        |
|---|-------------|-------|--------|--------|
| Pairs of Variables                      | Category    | Slope | Interc | Correl |
| A-Cognitive with Honest Aggression      | Males       | .104  | 13.64  | .081   |
|   | Females     | .148  | 13.51  | .130   |
|   | Non-contact | .074  | 14.16  | .070   |
|   | Team        | .087  | 14.01  | .070   |
| A-Somatic with Honest Aggression        | Males       | .104  | 14.61  | .080   |
| A-Cognitive with Cynical Aggression     | All         | -.039 | 17.17  | -.055  |
|   | Females     | .049  | 14.53  | .073   |
|   | Contact     | .025  | 16.86  | -.032  |
|   | Non-contact | -.042 | 17.09  | -.062  |
|   | Team        | -.071 | 18.06  | -.098  |
|   | Individual  | -.014 | 16.56  | -.020  |
| A-Somatic with A-Cynical                | All         | -.046 | 18.45  | -.062  |
|   | Females     | .047  | 15.75  | .061   |
|   | Contact     | -.029 | 18.06  | -.038  |
|   | Non-contact | -.051 | 18.42  | -.066  |
|   | Team        | -.072 | 18.38  | -.098  |
|   | Individual  | -.061 | 20.19  | -.083  |
| Self-confidence with Cynical Aggression | All         | -.047 | 23.19  | -.072  |
|   | Males       | .001  | 22.04  | .001   |
|   | Contact     | -.026 | 22.64  | -.039  |
|   | Non-contact | -.056 | 23.37  | -.086  |
|   | Team        | -.008 | 22.78  | -.014  |
|   | Individual  | -.048 | 22.16  | -.073  |

## APPENDIX 20

## MAIN STUDY RESULTS

CROSSTABULATION : Determining the Dependent and Independent Variables for Assessing the Relationship Between Athletic Types of Aggression and Competitive A-Trait.

**Table A.20.1 : Chi-Square Test for the Competitive A-Trait and the Athletic Types of Aggression**  
(Total Sample N = 598)

| Lambda Value  |        | Pearson<br>Chi-square<br>Value | DF | Significance |
|---------------|--------|--------------------------------|----|--------------|
| With HAG DV : | .13953 | 51.34454                       | 4  | .00000       |
| SCAT DV :     | .11671 |                                |    |              |
| with CAG DV : | .02332 | 5.47196                        | 4  | .24221       |
| SCAT DV :     | .00531 |                                |    |              |
| with AAG DV : | .17812 | 67.51118                       | 4  | .00000       |
| SCAT DV :     | .13528 |                                |    |              |

**Table A.20.2 : Chi-Square Test for the Competitive A-Trait and the Athletic Types of Aggression**  
(Males N = 388)

| Lambda Value  |        | Pearson<br>Chi-square<br>Value | DF | Significance |
|---------------|--------|--------------------------------|----|--------------|
| with HAG DV : | .10800 | 21.20194                       | 4  | .00029       |
| SCAT DV :     | .08980 |                                |    |              |
| with CAG DV : | .06048 | 10.14421                       | 4  | .03807       |
| SCAT DV :     | .03673 |                                |    |              |
| with AAG DV : | .18548 | 56.81181                       | 4  | .00000       |
| SCAT DV :     | .15918 |                                |    |              |

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**Table A.20.3 : Chi-Square Test for the Competitive A-Trait and the Athletic Types of Aggression  
(Females N = 210)**

| Lambda Value  |        | Pearson<br>Chi-square<br>Value | DF | Significance |
|---------------|--------|--------------------------------|----|--------------|
| with HAG DV : | .19380 | 24.45099                       | 4  | .00006       |
| SCAT DV :     | .17910 |                                |    |              |
| with CAG DV : | .09701 | 12.16696                       | 4  | .01615       |
| SCAT DV :     | .09701 |                                |    |              |
| with AAG DV : | .15504 | 24.73402                       | 4  | .00006       |
| SCAT DV :     | .18657 |                                |    |              |

**Table A.20.4 : Chi-Square Test for the Competitive A-Trait and the Athletic Types of Aggression  
(Contact Sport N = 317)**

| Lambda Value  |        | Pearson<br>Chi-square<br>Value | DF | Significance |
|---------------|--------|--------------------------------|----|--------------|
| with HAG DV : | .09709 | 16.87662                       | 4  | .00204       |
| SCAT DV :     | .12255 |                                |    |              |
| with CAG DV : | .01980 | 7.97187                        | 4  | .09261       |
| SCAT DV :     | .02941 |                                |    |              |
| with AAG DV : | .15075 | 40.00878                       | 4  | .00000       |
| SCAT DV :     | .17157 |                                |    |              |

**Table A.20.5 : Chi-Square Test for the Competitive A-Trait and the Athletic Types of Aggression  
(Non-Contact Sport N = 300)**

| Lambda Value  |        | Pearson<br>Chi-square<br>Value | DF | Significance |
|---------------|--------|--------------------------------|----|--------------|
| with HAG DV : | .19892 | 44.26515                       | 4  | .00000       |
| SCAT DV :     | .21429 |                                |    |              |
| with CAG DV : | .05820 | 6.22553                        | 4  | .18293       |
| SCAT DV :     | .05612 |                                |    |              |
| with AAG DV : | .15625 | 40.55984                       | 4  | .00000       |
| SCAT DV :     | .17347 |                                |    |              |

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**Table A.20.6 : Chi-Square Test for the Competitive A-Trait and the Athletic Types of Aggression  
(Team Sport N = 323)**

| Lambda Value  |        | Pearson<br>Chi-square<br>Value | DF | Significance |
|---------------|--------|--------------------------------|----|--------------|
| with HAG DV : | .13659 | 20.27442                       | 4  | .00044       |
| SCAT DV :     | .07353 |                                |    |              |
| with CAG DV : | .01442 | 1.58376                        | 4  | .81171       |
| SCAT DV :     | .01471 |                                |    |              |
| with AAG DV : | .15238 | 46.30660                       | 4  | .00000       |
| SCAT DV :     | .12745 |                                |    |              |

**Table A.20.7 : Chi-Square Test for the Competitive A-Trait and the Athletic Types of Aggression  
(Individual Sport N = 290)**

| Lambda Value  |        | Pearson<br>Chi-square<br>Value | DF | Significance |
|---------------|--------|--------------------------------|----|--------------|
| with HAG DV : | .18519 | 32.33220                       | 4  | .00000       |
| SCAT DV :     | .12994 |                                |    |              |
| with CAG DV : | .07937 | 8.01654                        | 4  | .09097       |
| SCAT DV :     | .05085 |                                |    |              |
| with AAG DV : | .17204 | 31.72311                       | 4  | .00000       |
| SCAT DV :     | .09605 |                                |    |              |

CROSSTABULATION : NO SIGNIFICANT RESULTS OF THE SCAT WITH THE AAI

**Table A.20.8 : Crosstabulation of Competitive A-Trait and Athletic Types of Aggression (CAG)  
No Relationship**

| Pairs of<br>Variables | Category    | Pearson<br>Chi-sq<br>Value<br>DF = 4 | Sig<br>Pear | Mantel-<br>Haenszel<br>Value<br>DF = 1 | Sig<br>M-H | Lambda |
|-----------------------|-------------|--------------------------------------|-------------|--|------------|--------|
| A-Trait<br>and CAG    | All         | 5.47                                 | .242        | .14                                    | .706       | .02332 |
|                       | Contact     | 7.97                                 | .092        | .25                                    | .616       | .02941 |
|                       | Non-contact | 6.23                                 | .182        | .39                                    | .528       | .05820 |
|                       | Team        | 1.58                                 | .811        | .04                                    | .848       | .01471 |
|                       | Individual  | 8.02                                 | .090        | .69                                    | .404       | .07937 |

CROSSTABULATION : NO SIGNIFICANT RESULTS OF THE AAI WITH THE CSAI-2

Table A.20.9 : Crosstabulation of Athletic Types of Aggression and Competitive A-State

No Relationship

| Pairs of Variables     | Category            | Pearson<br>Chi-sq<br>Value<br>DF = 4 | Sig<br>Pear | Mantel-<br>Haenszel<br>Value<br>DF = 1 | Sig<br>M-H | Lambda |
|------------------------|---------------------|--------------------------------------|-------------|--|------------|--------|
| A-Cognitive<br>and HAG | Males               | 8.28                                 | .081        | 7.38                                   | .006       | .00429 |
|                        | Females             | 3.23                                 | .519        | 2.53                                   | .111       | .00763 |
|                        | Non-contact         | 6.65                                 | .155        | 2.68                                   | .000       | .07527 |
|                        | Team                | 7.76                                 | .100        | 5.37                                   | .020       | .02538 |
|                        | <u>Individual*</u>  | 6.54                                 | .162        | 5.03                                   | .025       | .04839 |
| A-Somatic<br>and HAG   | Males               | 3.99                                 | .406        | 3.30                                   | .069       | .00816 |
|                        | <u>Females*</u>     | 7.21                                 | .125        | 7.06                                   | .007       | .05224 |
|                        | <u>Non-contact*</u> | 6.96                                 | .137        | 5.97                                   | .014       | .08247 |
|                        | <u>Team*</u>        | 7.46                                 | .113        | 4.95                                   | .026       | .00000 |
|                        | <u>Individual*</u>  | 5.70                                 | .222        | 4.79                                   | .028       | .05978 |
| A-Cognitive<br>and CAG | All                 | 2.39                                 | .665        | .61                                    | .435       | .01319 |
|                        | Females             | 3.79                                 | .435        | .98                                    | .321       | .03053 |
|                        | Contact             | .61                                  | .962        | .03                                    | .860       | .00000 |
|                        | Non-contact         | 1.89                                 | .755        | .27                                    | .602       | .01579 |
|                        | Team                | 2.48                                 | .647        | .74                                    | .389       | .00508 |
|                        | Individual          | 3.67                                 | .452        | .19                                    | .666       | .03226 |
| A-Somatic<br>and CAG   | All                 | 6.68                                 | .153        | 2.71                                   | .099       | .02308 |
|                        | Females             | 6.07                                 | .193        | 1.22                                   | .269       | .07463 |
|                        | Contact             | 1.61                                 | .807        | .11                                    | .735       | .02488 |
|                        | Non-contact         | 4.69                                 | .320        | .49                                    | .484       | .04639 |
|                        | Team                | 3.82                                 | .431        | 2.20                                   | .138       | .00000 |
|                        | Individual          | 2.74                                 | .601        | .17                                    | .678       | .03804 |
| Self-confid<br>and CAG | All                 | 5.03                                 | .284        | 1.93                                   | .047       | .00529 |
|                        | Males               | 9.23                                 | .055        | .09                                    | .754       | .05622 |
|                        | <u>Females*</u>     | 8.61                                 | .071        | 2.03                                   | .154       | .05263 |
|                        | Contact             | 6.09                                 | .192        | .07                                    | .792       | .01500 |
|                        | Non-contact         | 4.69                                 | .320        | 3.61                                   | .057       | .01554 |
|                        | Team                | 1.34                                 | .855        | .17                                    | .679       | .02551 |
|                        | Individual          | 3.96                                 | .411        | 2.51                                   | .112       | .00000 |
| A-Cognitive<br>and AAG | <u>Females*</u>     | 7.31                                 | .120        | 5.99                                   | .014       | .03101 |
|                        | <u>Contact*</u>     | 7.45                                 | .113        | 7.15                                   | .007       | .06404 |
| A-Somatic<br>and AAG   | <u>Females*</u>     | 8.43                                 | .077        | 8.22                                   | .004       | .05224 |
| Self-confid<br>and AAG | <u>Males*</u>       | 6.85                                 | .144        | 6.44                                   | .011       | .06426 |
|                        | <u>Contact*</u>     | 4.63                                 | .327        | 3.62                                   | .057       | .04000 |

\* For the underlined categories the corresponding row pairs of variables were not significant in crosstabs but were significant in regressions analyses.

## Appendix A

### APPENDIX A

#### ABBREVIATIONS

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|     |             |   |                      |
|-----|-------------|---|----------------------|
| 1.  | All         | : | Total Sample         |
| 2.  | Mal         | : | Males                |
| 3.  | Fem         | : | Females              |
| 4.  | C-S         | : | Contact Sport        |
| 5.  | NC-S        | : | Non-Contact Sport    |
| 6.  | I-S         | : | Individual Sport     |
| 7.  | T-S         | : | Team Sport           |
| 8.  | H or HAG    | : | Honest Aggression    |
| 9.  | C or CAG    | : | Cynical Aggression   |
| 10. | A or AAG    | : | Angry Aggression     |
| 11. | SF          | : | Significance of F    |
| 12. | A-T or SCAT | : | Competitive A-Trait  |
| 13. | A-Cog       | : | Cognitive Anxiety    |
| 14. | A-Som       | : | Somatic Anxiety      |
| 15. | S-Conf      | : | Self-Confidence      |
| 16. | DV          | : | Dependent Variable   |
| 17. | IV          | : | Independent Variable |
| 18. | Cat         | : | Category             |
| 19. | Gend        | : | Gender               |
| 20. | Var Pred    | : | Variable Predictor   |

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