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THE RELATIONSHIP BETWEEN ANXIETY AND PERFORMANCE OF BRAZILIAN JUDOKAS

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Luiz Carlos Moraes

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THE RELATIONSHIP BETWEEN ANXIETY AND PERFORMANCE OF BRAZILIAN JUDOKAS

By

Luiz Carlos Moraes

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ABSTRACT

THE RELATIONSHIP BETWEEN ANXIETY AND PERFORMANCE OF BRAZILIAN JUDOKAS

By

Luiz Carlos Moraes

A version in Portuguese (ICJ) of a multidimensional anxiety scale (the Competitive State Anxiety Inventory-2) was used to measure levels of anxiety immediately before and right after five matches during which male and female Brazilian judokas (judo athletes) participated in an important tournament. Results indicated that match 3 performance was a significant predictor of post match 3 self-confidence, and that post match 3 self-confidence was also related to match 3 performance. No significant changes were found in the three anxiety constructs across five matches. This lack of change may have been due to both the short period of time between matches and to cultural artifacts. Winners were observed to have higher self-confidence scores when compared with losers, and these results seemed to corroborate those of other researchers. In addition to this, males scored stable on cognitive anxiety and self-confidence while they increased in somatic anxiety during match 1. Finally, males had higher pre and post match 3 self-confidence scores than did females. The results of

this study suggested that (1) since the social construction of anxiety may be specific to a culture, testing of such constructs may have to be created for that culture, (2) the time interval for administering the ICJ between matches be standardized and (3) more research should focus on the anxiety levels of females.

DEDICATION

Aos meus queridos

Dulce e Daniel com
muito amor e carinho.

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CHAPTER 1

INTRODUCTION

Research has suggested that the level of competitive stress or anxiety can affect the performance of an athlete. There is evidence to support the belief that too high a level of anxiety can inhibit athletic performance since athletes have reported poor performance due to being too anxious about an event (Silva & Weinberg, 1984; Martens & Landers, 1970; Fenz, 1975). High levels of anxiety may distort the external perception around the athlete causing wrong reactions in the moments of decision (Easterbrook, 1959, Nideffer, 1976a, 1976b). Others (e.g., Carron & Bennett, 1977) have found that the presence of a coach elevated state anxiety, while the presence of an audience did not (Landers, Brawley, & Hale, 1977). Gould, Horne, and Spreeman (1983a) examined the precompetitive and competitive state anxiety pattern of 458 junior elite wrestlers. They rated typical levels of anxiety of junior elite wrestlers at different points in time and during a competition. Their findings revealed that wrestlers became nervous or worried in 67% of their matches, and that their nervousness

sometimes enhanced and sometimes inhibited their performance.

Currently, sport psychologists, coaches, and athletes are trying new strategies to help athletes to reduce levels of anxiety. Biofeedback and stress management are two of such strategies (Silva & Weinberg, 1984). In order to help athletes control their anxiety, researchers are attempting to determine adequate and critical levels of anxiety which promote good performance, and to explore the correlation of these levels with other factors, such as the athlete's experience and age, (Landers, 1980) and task difficulty (Oxendine, 1970).

Statement of the Problem

Since sport psychology is a new field of study in Brazil, there seems to be some urgency in conducting research with and for Brazilian athletes. Two main problems which affect such scholarly investigations are the inadequacy of knowledge due to unavailability of translated materials into the Portuguese language, and a lack of research focusing on anxiety patterns, particularly in judo.

The competition combat field is a promising field laboratory to explore the relationship between performance and levels of anxiety because of the characteristic of the event. The competition combat field pits one individual opponent against another, and in such events, the individual

athletes are most likely to attribute success or failure to themselves rather than to their team or coach. One of the questions that needs to be answered is the degree to which anxiety has an influence upon performance and vice versa.

The purpose of this study has been to investigate the relationship between performance and patterns of anxiety of judokas. Specifically, the investigator (1) used a multidimensional scale to measure levels of anxiety immediately prior to and right after competition, (2) repeatedly assessed levels of anxiety as judokas progressed through an important tournament, and, (3) obtained information about the pattern of sport-related anxiety in another culture.

Significance of the Study

Ever since judo was selected as an athletic event in the Tokyo Olympic Games of 1964, it has become very popular sport. The number of judokas has increased all over the world to around 6,000,000 participants (Espy, 1981). Judo is especially popular in Brazil.

Culturally comparative studies of anxiety patterns in athletes and the extent of sport specificity of the patterns of each dimension of anxiety are not yet known (e.g., are all combative sports similar?). Although researchers have explored the anxiety patterns and level of wrestlers, none have focused on those combative sports which comprise the

martial arts. This study will mark the first time that anxiety patterns of judokas will be assessed. The martial arts are different from wrestling in that the latter is only a sport whereas the former is both an art and a sport. Thus, the proposed study of Brazilian judokas should enlarge the body of knowledge regarding anxiety from both a cross-cultural and a sport-specific stand point.

It is the investigator's personal experience that one of the main questions of many coaches and athletes in Brazil is how to manage anxiety during a competition. Little research has been done on the levels of anxiety of Brazilian athletes or precompetitive and competitive anxiety. This research will be a pioneer study and the first step in answering many of the questions involving anxiety levels related to performance, and how to cope with them. In addition, the results of the study should yield information which will enhance the understanding of relationships between anxiety-performance in a different culture.

Background on Population and Sport for this Study

The selection of Brazil for data collection seemed very appropriate due to the popularity of judo in that country. Most of the public and private schools have judo clubs on the roll of their sport activities. Also, many schools of judo (academies) are found around the country. Each State Federation conducts a variety of tournaments for those aged

7 and up. Male athletes fight in age determined categories, while females have only one category. Each state also sponsors athletes in the regional competitions which are followed by national championships in different capitals every year.

The organization, the rules, and system of rank classification of judo in Brazil is the same used in the USA (bracket system), since both are under the same International Judo Federation (IJF) which determines the regulations of the judo competitions. Inside Brazil, the Brazilian Confederation of Judo, (also, member of IJF), controls all national and state tournaments around the country (see Appendix E). In this study, the data were collected in a state competition under control of the Minas Gerais State Judo Federation (MGJF), where the best judo athletes (male and female) of the state competed against each other.

Hypotheses

Hypothesis 1:

a) State anxiety (cognitive, somatic and self-confidence) is a significant predictor of performance across three matches.

b) Performance is a significant predictor of state anxiety (cognitive, somatic and self-confidence) across three matches.

Hypothesis 2:

a) **Prematch cognitive anxiety scores and self confident scores will remain stable while prematch somatic anxiety scores will show a significant increase across five matches.**

b) **Post cognitive and somatic anxiety scores will show a significant decrease while post match self-confidence scores will show a significant increase across five matches.**

Hypothesis 3:

a) **The level of cognitive and somatic anxiety scores immediately after a win match will be significantly higher while the level of self-confidence scores will be significantly lower than that immediately prior to the next match.**

b) **The level of cognitive and somatic anxiety scores immediately after losing a match will be significantly higher while the level of self-confidence scores will be significantly higher than that immediately prior to the next match.**

Hypothesis 4:

Winners will have a lower post match mean cognitive scores and post match somatic anxiety scores and higher post match self-confidence scores than losers.

Hypothesis 5:

a) There will be a significant difference in pre/post test scores of match 1 for each of the three dimensions of anxiety (cognitive, somatic and self-confidence) among males.

b) There will be significant differences in pre/post test scores of match 1 for each of the three dimensions of anxiety (cognitive, somatic and self-confidence) among females.

Hypothesis 6:

a) Males will have a significantly lower prematch mean cognitive and prematch somatic anxiety scores and higher prematch mean self-confidence scores than will females.

b) Males will have a significantly lower post match mean cognitive and post match somatic anxiety scores and higher post match mean self-confidence scores than will females.

Limitations

1. The availability of only one sport-specific instrument (CSAI-2) to assess state anxiety precluded the investigator from selecting the best instrument.
2. The translation from English to the Portuguese language may have resulted in loss of the exact meaning of the items of the CSAI-2.

3. The cross cultural differences in the conceptualizing and experiencing of anxiety may have hampered the investigator from obtaining and comparing results to those found by investigators using American subjects.

Definitions

Anxiety: a self reporting feeling of apprehension which usually accompanies high arousal.

Inventario de Competicao de Judo (ICJ): the Portuguese version of the Competitive State Anxiety Inventory-2, an instrument designed to assess state anxiety in a multidimensional manner.

Judoka: an athlete who competes in judo.

Performance: 1. Match performance (MP) will consist of a score ranging from 0 to 10. These scores are awarded by judges for each match and each competitor.

State-Anxiety: an individual's anxiety in the present moment in response to a stressful situation characterized by feelings of apprehension.

Trait-Anxiety: an individual's "general predisposition to respond across many situations with high levels of anxiety" (Landers & Boutcher, 1986, p. 169).

CHAPTER 2

REVIEW OF THE LITERATURE

Definition of Anxiety

The term anxiety refers to debilitating apprehension during a given period. Many individuals in stressful situations such as competitive events and educational tests may feel threatened, or unable to perform because of anxiety (Cratty, 1983). Thus, anxiety is a very popular research topic in the field of sport psychology. Spielberger (1966) operationally defined state anxiety (A-State) "as a transitory emotional state that varies in intensity and fluctuates over time" (p. 13). Trait anxiety (A trait) is assumed to:

> reflect residues of past experience that in some way determine individual differences in anxiety proneness, i.e., in the disposition to see certain types of situations as dangerous and to respond to them with A-state (Spielberger, 1966, p. 18).

Liebert and Morris (1967) separated anxiety into two components: worry (cognitive) and emotionality (somatic). They stated that worry is "primarily a cognitive (worry) concern about the consequences of failing, the ability of others relative to one's own" (p. 975), and somatic (emotionality) refers to "autonomic reactions which tend to

occur under examination stress" (p. 975), or physiological-affective elements of unpleasant feeling states such as nervousness and tension. Sarason (1975) suggested that self-confidence was a third dimension of anxiety and defined it as a perception of negative outcomes, preoccupation with self-evaluation involved in some specific situation.

How anxiety influences each individual's performance opens many questions and requires systematic investigation. The researchers who initially investigated anxiety in competitive situations focused on trait anxiety and assumed that it was characterized by physiological arousal. The relationship between arousal and performance was assumed to take the shape of an inverted-U curve. Landers and Boucher (1986) operationally defined arousal as alertness or readiness which varies "in a continuum ranging from deep sleep to extreme excitement" (p. 164). When arousal becomes extremely high, one may experience unpleasant emotional reactions. This maladaptive condition is often referred to as stress or state anxiety. Thus, arousal refers only "to the intensity dimension of behavior, while state anxiety refers to both intensity and direction" (Martens, 1977 p. 5). In sum, anxiety is defined in terms of negative affect.

The Inverted-U Hypothesis

The inverted-U hypothesis (Yerkes & Dodson, 1908), states that there is a curvilinear relationship between the

intensity of arousal and the effectiveness of performance up to some optimal point. The inverted-U hypothesis explains why moderately stressed subjects perform significantly better than subjects in the high or low stress condition. Thus, for example, in judo competition, judokas may perform poorly because they are either over or underaroused.

Anxiety and Performance

The relationship between anxiety and sport performance is not clearcut, and is confounded by several variables. The results of studies by Fenz and Epstein (1967), Fenz and Jones (1972), Fenz (1975), Mahoney and Avener (1977), Gould, Horn, and Spreeman, (1983b) have indicated that there is a relationship between performance and anxiety in a specific situation; that is, the optimum level of anxiety prior to competition which will enhance performance, may vary according to the individual situation as well as type of sport.

Fenz and Epstein (1967), Fenz and Jones (1972), and Fenz (1975) investigated the levels of anxiety in sport parachutists in an extensive series of investigations. Anxiety was assessed by heart rate, respiration rate, and projective tests on a number of occasions prior to competition. The findings showed that inexperienced (and poor performance) jumpers showed a great increase in physiological activity and reported an increase in anxiety

and fear up to the moment of jump. Experienced parachutists (and good performance) showed, at first jumps, an increase followed by a sharp decrease in anxiety or physiological activity, which meant that responses were only slightly above normal.

Mahoney and Avener (1977) examined anxiety patterns in 12 elite gymnasts competing for a spot on the 1976 US Men's Olympic Gymnastics team. They answered a psychological skills inventory 48 hours prior to the final qualifying meet. A 10 point Likert-type scale was used at various times preceding competition to assess anxiety patterns. Differences in anxiety patterns were found between successful gymnasts who were selected and unsuccessful gymnasts who had not been selected. However, better gymnasts exhibited higher levels of anxiety prior to competition but lower levels during actual performance.

Fenz and Epstein (1967), Fenz and Jones (1972), Fenz (1975) and Mahoney and Avener (1977) found that for the experienced/successful athlete the anxiety pattern had the shape of an inverted U. These studies also seemed to confirm the idea that degree of experience influenced levels of anxiety. Gymnasts, however, were more anxious prior to competition than were parachutists, which indicated that task performance may influence anxiety levels, that is, anxiety levels may vary by task performance. Thus, possibly, different levels of anxiety may be associated with each sport or each type of sport.

Meyers, Cooke, Cullen, and Liles, (1979) compared the competitive anxiety patterns of nine elite racquetball competitors. The findings revealed that the anxiety patterns of skilled (national champion) as compared to less skilled players (collegiate competitors) differed. Both groups started equally anxious, but as soon as the time of competition approached and started, the better players exhibited a plateau in anxiety; however, the anxiety of the less skilled continued to increase, which indicated that the levels of anxiety may increase or decrease according to the skill levels of athletes.

Highlen and Bennett (1979) tested 39 wrestlers competing for berths on three Canadian World Wrestling teams. Results in anxiety patterns differed between wrestlers who qualified and those who did not. Wrestlers who qualified reported lower levels of anxiety, even though anticipatory anxiety before competition was higher than anxiety exhibited during competition. The findings indicated that athletes with lower levels of anxiety had a better performance.

Gould, Weiss, and Weinberg, (1981) replicated the Highlen and Bennett (1979) study, using a sample of 49 collegiate wrestlers participating in the 1980 Big Ten Wrestling Championship. Contrary to the previous studies in which the anxiety patterns of win-loss wrestlers were compared, this study showed few differences between winners and losers. Thus, the Highlen and Bennett (1979) results

were not replicated. Further studies therefore should be conducted on combative sports to explore the contradictory findings.

Gould, Horne, and Spreeman, (1983b), conducted a study to examine the precompetitive and competitive anxiety patterns of junior elite wrestlers (N=458) participating in the United State Wrestling Federation Junior National Championships. Univariate regression analyses were used to examine the relationship between success-failure, years wrestling experience, age, trait anxiety, and precompetitive and competitive state anxiety. The authors used the SCAT and other questions to determine patterns as well sources of anxiety.

The results of this study showed that the wrestlers' anxiety increased as the time of competition approached, and anxiety ratings declined when competition began. In other words, their patterns of anxiety exhibited an inverted U shape. Anxiety scores were compared across age, experience and performance. Winners were those who were classified above sixth place finish while nonwinners were those who classified below sixth place. The findings showed that there were "no differences in precompetitive and performance anxiety patterns between successful and less successful and between more and less experienced competitors" (p. 69). Unlike earlier cited studies, however, these findings were consistent with the findings of Gould et al. (1981). The scores comparing low-high SCAT wrestlers revealed "large

consistent anxiety differences," which supported the research of Martens and Gill (1976), Scanlan and Passer (1978,1979), and Weinberg and Hunt (1976) and confirmed the importance of trait anxiety to understanding competitive state anxiety. The relationship between age and anxiety was low since younger wrestlers (13 to 16 years of age) and older wrestlers (17 to 19 years of age) did not differ in anxiety patterns.

Gould et al., (1983b), gave several explanations for the lack of support of the results for those in previous studies of anxiety; (1) small sample size in some previous studies, (2) the measurements of precompetitive (state) and performance (trait) anxiety may not have been accurate, because the athletes' answers were about how they typically felt before competition and (3) the anxiety differences may have been the result of the specific sample tested.

Thus, the anxiety-performance relationship needs to be viewed more carefully. Specifically, across-study comparisons may be hampered by differences in subjects' years of experience and type of sport. The anxiety patterns in such studies may also be affected differentially by the importance of the event and the diffusion of anxiety throughout a tournament which consists of a series of events of increasing importance. Gould et al. (1983b) suggested that anxiety is multidimensional in nature and that these dimensions (cognitive, somatic, behavioral) should be assessed separately since each may affect performance in

different levels. Gould et al. also recommended that future studies assess multidimensional anxiety using inventories, such as the Competitive State Anxiety Inventory (CSAI-2), developed by Martens, Burton, Vealey, Bump and Smith (1983). In addition, no available research is present to analyze how anxiety is manifested in a crosscultural setting.

Finally, none of the cited investigators compared anxiety across gender. There is reason to believe that women and men may experience psychological constructs differentially with respect to sport (see Birrell, 1983, for an overview of this research). Generalizing results from males to females, therefore, is not defensible. Thus an in-depth exploration of anxiety patterns of athletes should include both female and male subjects. In addition, historically, Brazilian judo has been primarily a male oriented sport. However, in recent years many females have become judokas. Thus the investigator will use gender as a variable.

In summary then, the relationship between performance and anxiety has not been clearly established. Investigators who have compared anxiety patterns of successful and unsuccessful athletes in gymnastics (Mahoney & Avener, 1977), racquetball (Meyers, Cooke, Cullen, & Liles, 1979) diving (Highlen & Bennett, 1983) and wrestling (Highlen & Bennett, 1979) found that successful athletes had a higher level of anxiety before the competitive event, and a lower level during it. In contrast the data from two studies of

wrestlers (Gould, Weiss, & Weinberg, 1981), showed no significant differences in the patterns of anxiety between winners and losers. The contradictory nature of the results may be due in part to the fact that these studies focused on trait anxiety and assumed that anxiety is unidimensional. The use of unidimensional measures probably affected the results, since a multidimensional approach seems to be a more comprehensive approach to measure anxiety.

Independence of Dimensions

Anxiety as currently defined consists of three dimensions: cognitive, somatic and self-confidence. Morris and Liebert (1969), Morris, Harris, and Rovins, (1977) and Morris, Brown & Halbert (1977) found that cognitive (worry) and somatic (emotionality) responses could be aroused independently. Both components depend on the existence of different situational conditions. Worry scores were high among students in a situation of a very important examination (5 days before), with no elevated symptoms in emotionality (Spiegler, Morris & Liebert, 1968). These studies have indicated that emotionality scores typically decrease significantly after a period of time. Yet, worry scores did not increase unless the student's performance expectancy increased during the test (Morris & Fulmer, 1976). Researchers (Deffenbacher, 1977; Morris & Liebert, 1969; Morris & Perez, 1972) who studied worry and

emotionality found that the cognitive component of anxiety (worry) was a better predictor of performance than was emotionality (somatic).

Similarly, self-confidence, another component of anxiety also affects performance (Sarason, 1975). Sarason found that students preoccupied with their own self-evaluation and the possibility of negative outcomes involved in some specific situation tended to decrease in performance. Thus, the relationship between anxiety and performance seems to be complex, since the components of anxiety may interfere with performance in independent ways.

Antecedents of Anxiety

Martens, Burton, Vealey, Bump and Smith (1983), emphasized that the dimensions of anxiety must be measured separately because they are manifested in different antecedent conditions. The environment, degree of noise, size of crowd and importance of the event, for instance, are stimulants which may influence somatic anxiety. On the other hand, cognitive anxiety may be affected by the athlete's perceived ability. Worry, perceptions of past and present performance, difficulties, or opponent ability are some of the many antecedents of cognitive anxiety. Similarly, somatic anxiety seems to increase prior to competition, whereas cognitive anxiety shows little change, and only with the expectation of success (Martens et al., 1983).

Gould, Petlichkoff and Weinberg (1984), conducted two investigations to examine antecedents of, relationships among, and temporal changes of the dimensions of anxiety. They predicted that cognitive and somatic anxiety would influence performance in different directions.

Demographic and anxiety (CSAI-2) questionnaires were administered to 37 elite intercollegiate wrestlers 10 minutes before two different competitions. The prediction that somatic anxiety would increase prior to competition time while cognitive and self-confidence remained constant was confirmed. The antecedents of the anxiety dimensions were different from those found by others (Martens et al., 1983; Fenz, 1975). The assumption that cognitive anxiety would be a stronger predictor of performance than somatic anxiety was only partially supported, while the prediction that there would be differences in somatic anxiety between experienced vs. inexperienced athletes (Fenz, 1975) was not supported. In conclusion, these findings indicate that more studies are needed to investigate the influences of the three anxiety dimensions on performance.

In the second study, Gould et al. (1984) investigated the dimensions of anxiety with varsity volleyball players. Sixty-three female high school varsity volleyball players answered the CSAI-2 on five different occasions prior to competing (1 week, 48 hours, 24 hours, 2 hour and 20 minutes prior to competition).

The prediction that somatic anxiety would initially decrease and would increase prior to competition while cognitive anxiety and confidence would remain stable was supported. The assumption that experienced athletes would differ from inexperienced athletes in state anxiety prior to competing was not supported. The prediction that both the somatic and cognitive anxiety patterns of inexperienced athletes would show a linear increase prior to competition while that of experienced athletes would increase followed by a decrease was found for neither somatic nor cognitive anxiety. Finally, the investigators concluded that the CSAI-2 was not "consistently a powerful predictor of athlete performance" (Gould et al. 1984, p. 302). In conclusion, these investigators found that (1) CSAI-2 assessed three separate dimensions of state anxiety which can be measured independently by the CSAI-2, (2) somatic anxiety seemed to increase prior to competition, (3) the dimensions of anxiety were not influenced equally by the same antecedent factors. In addition, the assumption that cognitive anxiety was a more powerful predictor of performance than somatic anxiety was only marginally supported.

Krane and Williams (1987) compared changes in cognitive anxiety, somatic anxiety, and self-confidence prior to competition of high school gymnasts and college golfers. The CSAI-2 questionnaires were administered 24 hours, 1 hour, and 10 minutes prior to competition. Thirty six girls on three high school gymnastic teams competing in conference

meets and 44 women collegiate golfers representing 13 Division I National Collegiate Athletic Association (NCAA) teams competing in the University of Arizona Invitational Golf Tournament were the subjects in this study.

No significant differences in self-confidence nor in cognitive anxiety were found among the golfers prior to the practice round, first tournament round, and second tournament round. Tests revealed that somatic anxiety prior to the first tournament round was significantly higher than that during the practice round, but there was no difference between somatic anxiety on the first and second tournament rounds. Overall, golfers displayed lower cognitive anxiety, lower somatic anxiety and greater self-confidence than the gymnasts. For the golfers, cognitive anxiety tended to decrease as time for the competition drew closer while it tended to increase for the gymnasts. Golfers and gymnasts experienced the same level of somatic anxiety 24 hours prior to competition, but the latter increased in somatic anxiety as competition approached while golfers remained constant. For the golfers, self-confidence tended to increase slightly as competition approached while the gymnasts self-confidence dropped slightly from 24 hours to one hour prior to competition and increased slightly at ten minutes prior to competition. None of the subcomponents was able to predict performance.

These findings seem to be consistent with the suggestion by Martens, Burton, Vealey, Smith and Bump (1983)

who stated that athletes participating in a sport scored subjectively by judges would tend to have a higher level of cognitive anxiety and lower self-confidence than athletes in objectively scored sports; however Martens et al. (1983) found no somatic differences, which contradicted the findings of Krane and Williams (1987). These differences may be related to the nature of the sport. The findings also, suggested that golfers and gymnasts may not have perceived their respective athletic competitions in the same way. The gymnasts were competing in a conference meet and golfers in a practice round tournament, which may have resulted in a greater stress situation for the gymnasts so that they experienced more cognitive and somatic anxiety and less self-confidence than the golfers. Also, the possible explanation for why gymnasts had an increase in cognitive anxiety and a decrease in self-confidence at time the competition approach, was perhaps because the athletes in this study were less skilled and less-experienced. These results were in contrast to findings in previous studies (Gould et al. 1984; and Martens et al. 1983), which showed no changes. Thus, future researchers should attempt to determine specific antecedents which influence the dimensions of anxiety and their relationship with performance. This relationship among the dimensions of anxiety and performance was explored by McAuley (1985).

Performance State Anxiety as Predictors of Each Other

McAuley (1985) studied the relationship among the dimensions of state anxiety and the extent to which precompetitive state anxiety would predict golf performance and to which golf performance significantly influenced post competitive state anxiety. Seven volunteers from the women's varsity golf team of the University of Iowa completed the CSAI-2 immediately prior to and immediately following each 18-hole tournament round. Data were collected from 10 competitive rounds during the fall season. The performance measure consisted of the total score for each round.

A comparison of the dimensions scores with precompetitive CSAI-2 sub-scales and performance results indicated that neither somatic nor cognitive anxiety scores were significant predictor of golf performance while self-confidence was only moderately related to performance. However, performance scores were significant predictors of post performance cognitive state anxiety and self-confidence.

McAuley (1985) suggested that the lack of relationship between somatic state anxiety and performance was due to the nature of the sport. Specifically, somatic anxiety may have been diffused over the time it took to play a round, usually a period of two or three hours. In addition, since the CSAI-2 post competitive measures were assessed at the end of each 18-hole competitive round, McAuley suggested that possibly

anxiety had different levels during competition in some cases and post competition in others. He suggested that the subjects be asked retrospectively to indicate after the performance (after 18-hole) how they had felt during the performance, since it is difficult to assess athletes during a competition. These results indicated that more research is needed to determine levels of state anxiety and self-confidence during performance rather than prior to competition.

McAuley found that only precompetitive self-confidence correlated with golf performance but yet was not a significant predictor of performance. However, performance was a significant predictor of post competition self-confidence possibly because the golfers knew their score throughout the round. Golf performance was a more important predictor of state anxiety and self-confidence than vice versa.

The lack of statistical support for some of the assumptions cited earlier may also have been a function of design, that is, none of the studies cited, investigated the extent to which a linear or a curvilinear design was best suited to explain the relationship among the dimensions of anxiety and performance.

Type of Relationship

Gould, Petlichkoff, Simons and Verera (1987) therefore examined the relationship between the dimensions of anxiety and performance under linear or curvilinear functions. Their sample consisted of 39 subjects from the University of Illinois Police Training Institute who were participating in a pistol shooting competition, with each subject shooting on five separate occasions. Questionnaires were administered to all subjects to assess background information and anxiety (CSAI-2). The officers shot six rounds each with a five pistol sequence from a distance of 15 yards. Performance was assessed by standardized scoring system (PTI), ranging from a low of 10 to a high of 60 for any one sequence. The intraindividual analysis procedure was used to test the predicted CSAI-2 subscale scores and performance relationship. Significant differences were found between levels of anxiety (lowest vs. moderate, and moderate vs. highest) and performance for each subscale. No relationship was found between cognitive anxiety and performance. However, the somatic anxiety/performance relationship was best explained by a curvilinear (inverted-U) significant quadratic function while the confidence/ performance relationship was best explained by a significant negative linear function. The results contradicted previous research that found that cognitive anxiety had a greater influence on performance than did somatic anxiety. Gould et al. suggested

that somatic anxiety may have influenced pistol shooting performance because this task requires fine muscular control. The results also showed that somatic anxiety was related to performance only within lower ranges of cognitive anxiety. This study demonstrated that anxiety is multidimensional, that the patterns of each type of anxiety vary uniquely with performance and by sport, and that a curvilinear relationship employing an intraindividual analysis procedures may be useful in explaining results.

Other Factors which Affect Anxiety

Anxiety, Stress, and Attention

Researchers (Martens & Gill, 1976; Scanlan, 1978, 1979) concerned about stress, anxiety, and performance found that athletes who possessed high levels of anxiety tended to perform poorly when confronted with a stress situation such as an important event. Similarly, Bramwell, Masuda, Wagner, and Holmes, (1975) have suggested that intensity of stress in the athlete's life (death in the family, break up with a loved one or economic problems) can predict a bad performance or injury.

Similarly, a high degree of emotional arousal accompanied by anxiety tends to reduce the number of cues utilized in executing a task or performing a skill (Easterbrook, 1959, Nideffer, 1976). Easterbrook's cue

utilization theory stated that as arousal increases, the visual field narrows (tunnel vision), and as arousal decreases to a low level, a broad visual field is manifested by attention to irrelevant cues.

Anxiety and Type of Task

According to the researchers, (Oxendine, 1970: Weinberg & Genuchi, 1980: Landers, 1980) tasks that require fine motor skills (golf, archery, bowling), require an athlete to perform at a lower level of anxiety. On the other hand, during tasks that require a high degree of physical exertion (weight lifting, sprinting, and football-defense), athletes are enhanced by a relatively high level of anxiety, which leads this investigator to infer that judokas should have a high level of anxiety. The point at which this high level interferes with the visual field of judokas is not known at this time.

Measurements of Anxiety

Unidimensional Approach

In the early 1900's psychologists and psychiatrists assessed anxiety using indirect methods such as having clients project or expose their internal emotion and fears. Another approach, which was more direct, used a

questionnaire. The Manifest Anxiety Scale by Taylor (1953) was one of the many tests developed and became very popular. The Manifest Anxiety Scale (MAS), measured individual differences in anxiety proneness (A-trait). Later, Taylor stated that anxiety scales should be administered in the presence of some stressor, such as competition. However, the scale still failed to distinguish between trait and state anxiety.

Spielberger, Gorsuch and Lushene (1970) introduced two separate measures of anxiety in their State-Trait Anxiety Inventory (STAI) to assess an individual's permanent personality disposition (trait-anxiety), and emotional reactions in moments of stress or transitory situations (state-anxiety) based on the Spielberger (1966) theory and research on anxiety. The questionnaire consisted of a set of questions which assessed a person's retrospective feelings of anxiety (e.g. "How did you feel . . .") prior to some test and asked the person to imagine ahead (e.g. "How will you feel before the next test in one month"). The STAI has been used in more than 500 studies as a clinical and research instrument (Biaggio, Natalicio & Spielberger, 1976). Once again however, the need for a stressful situation which could expose one to emotional changes emerged, since the classroom and laboratory setting are limited in this aspect. The establishment of a sport specific instrument was a new approach to measure anxiety in

the unique environment of competitive sport and thus in a stressful situation.

Sport Competition Anxiety Test (SCAT)

Martens (1977), developed the Sport Competition Anxiety Test (SCAT) which measures the anxiety an athlete generally feels (trait) when competing in sports. This test was grounded in Spielberger's (1966) distinction between trait and state anxiety. Martens hypothesized that persons exhibiting higher levels of A-Trait anxiety would respond to threatening situations more intensely in A-State ("right now") reactions. The test used questions that asked the athlete how they usually feel when competing in sports and games (e.g. "Before I compete I feel uneasy", "I get nervous waiting to start the game"). Each item was answered on a 3 point scale ("often", "sometimes", hardly-ever"). Martens established that the test has satisfactory reliability and construct validity. (Martens, & Simon 1976; Martens, & Gill, 1976).

Multidimensional Approach on Sport

Competitive State Anxiety Inventory (CSAI)

The SCAT, however, measured trait anxiety and was based on the assumption that anxiety was a unidimensional

construct. Thus, Martens (1977) developed the CSAI which is a short version of State-Trait Anxiety Inventory (STAI) developed by Spielberger et al. (1970). The CSAI was designed to assess anxiety in situations specific to competitive settings, and also introduced a multidimensional approach that separately assessed cognitive (worry) and emotional (somatic manifestation) state anxiety components. The CSAI differed from SCAT because the former measures only state anxiety reactions and uses a two dimensional approach.

The naming of self-confidence as another dimension of anxiety (Sarason, 1975) required the construction of a new instrument. The Competitive State Anxiety Inventory-2 (CSAI-2) developed by Martens, Burton, Vealey, Bump and Smith (1983) was grounded in the work of Sarason (1975), Borkovec (1976), Schwartz, Davison and Goleman (1978), and Morris and Hutchings (1981). It included assessment of a third component, self-confidence. In fact, the CSAI-2 is derived from Martens' (1977) original Competitive State Anxiety Inventory (CSAI).

Martens and his colleagues (1983), found similarity in results with those of prior studies (Liebert & Morris, 1967; Schwartz, Davison & Goleman, 1978)), when they measured separately the cognitive (worry) and somatic (physiological arousal) state anxiety components. In addition, a third component, self-confidence, was identified by factor analysis. While self-confidence correlated negatively with cognitive and somatic subscales, these correlations were

only moderate. Thus, the CSAI-2 assesses three dimensions: cognitive anxiety, somatic anxiety, and self-confidence. The reliability based on 3 samples of CSAI-cognitive, CSAI-somatic, CSAI-self-confidence were .79, .82, and .88, respectively. The correlation of 7 trait scales with CSAI-2 demonstrated adequate concurrent validity for the three sub-components.

Summary

The literature reviewed indicates an evident relationship between anxiety and performance. The findings have shown clear differences in precompetitive anxiety levels between successful and non-successful performers, which suggests that poor performers react with a greater increase in physiological activity and report an increase of anxiety (high level).

Recent studies have suggested a lack of interdependence among the dimensions of anxiety. Furthermore, somatic anxiety seems to increase during the time leading to competition, while cognitive anxiety and self-confidence seems to remain constant. Also, some investigators have found that cognitive anxiety is a better predictor of performance than is somatic anxiety. Future research assessing the dimensions of anxiety during, instead of prior to competition was suggested. The standardization of

performance scores, an intraindividual approach and curvilinear functions should be considered for use.

The studies cited in this review suggest that anxiety and performance seem to vary by sport, by person, and by stress situation. Also, only a few sports have been used to study these relationships. The need for more investigations of anxiety in other sports (to see if patterns hold), and situations should be addressed. Another important procedure is to find out the extent to which anxiety is a function of cultural influence, and of actual competition, using both female and male subjects.

CHAPTER 3

METHODOLOGY

Instrumentation

Inventario de Competicao de Judo (ICJ)

Anxiety was assessed by a translated version of the CSAI-2 called "Inventario de Competiçao de Judo." The ICJ consisted of twenty seven 4-point Likert-type scale items which asked how the individual feels "right now" for each item ranging from 1 (not at all) to 4 (very much so), e.g., "I am concerned about losing"; "I feel my stomach sinking"; "I am concerned I won't be able to concentrate"; "I am confident I can meet the challenge." The negative connotation items comprised the cognitive anxiety (worry) subscale, the positive connotation items comprised the self-confidence scale, and words that expressed tension comprised the somatic scale (emotionality) (see Appendix A).

Pilot Study

The investigator used the following procedure to transform the CSAI-2 into the ICJ. First, the CSAI-2 was translated by two Brazilian graduate students from Michigan State University into the Portuguese language. Later, two other Brazilian graduate students from the same university, each independently, translated the same questionnaire back to the English language. Subsequently, both questionnaires were compared with the original CSAI-2. The problems which developed during the translation and editing process were resolved at this time. The resulting instrument, the ICJ, was administered to 97 male and female Brazilian physical education undergraduate students. The resulting scores served as baseline data for the ICJ in a noncompetitive environment.

Cronbach alpha procedures were used to determine the internal consistency of the ICJ. The results indicated that the values of Cronbach's alpha were .80 for the questions comprising the cognitive anxiety dimension, .80 for the somatic dimension and .83 for the self-confidence dimension. The magnitude of these coefficients indicated that the ICJ had acceptable levels of internal reliability. A copy of both the CSAI-2 and the ICJ can be found in Appendix A.

Performance Measures

One measure of performance was used which consisted of a score ranging from 0 to 10. These scores are awarded by judges for each match and each competitor (see Appendix B).

Population and Sampling

Profile of Tournament Participants

The subject population consisted of 70 male and female athletes who had belt colors ranging from white to black, who attended the Minas Gerais State Judo Championship, and who were between 13 and 33 years of age. Specifically, The sample consisted of judokas aged 13 to 33 with the mean age being 21.38 years (SD = 4.14). Twenty four participants were classified as senior males (ages 21 to 29), 19 were classified as junior males (ages 18 to 20), while 27 were females ranging in ages from 13 to 33 with the mean age being 19.78 years (SD = 4.57). Frequencies of belt levels, gender and age are given in Table 1.

Table 1
Frequencies of Age, Belt Levels and Gender.

Ages	White m	White f	Blue m	Blue f	Yell* m	Yell* f	Oran* m	Oran* f	Green m	Green f	Purp* m	Purp* f	Brown m	Brown f	Black m	Black f	Total m	Total f
13-15	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
16-18	-	3	-	-	-	4	-	1	-	3	5	1	2	-	-	-	7	12
19-21	-	1	-	-	-	-	1	1	1	-	3	1	6	1	1	1	12	5
22-24	-	-	-	1	-	1	1	1	1	-	-	-	1	1	6	-	9	4
25-27	1	-	-	1	-	-	1	1	-	-	-	-	3	1	6	-	11	3
28-30	1	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	3	-
31-33	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
missing	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-
Total	2	6	-	2	-	5	3	4	2	4	9	2	13	3	14	1	43	27

* yellow, orange, purple

This tournament was chosen for the following reasons: (1) most of the athletes were the best in the state since they had qualified through city tournaments, (2) both sexes participated, (3) the competition involved different belt levels, and (4) the tournament took place in Brazil. The day prior to the tournament, the investigator met with the athletes and their coaches and described and explained the purpose and design of the study. Athletes were then asked to volunteer to participate. All tournament judokas participated in the study although one person did not return the demographic information sheet.

Consent for Conducting Study

Permission to conduct the study was requested from and granted by the Human Subjects Review Committee at Michigan State University, by the Brazilian Judo Federation, and by the president of the Minas Gerais Judo Federation (see Appendix C).

Procedure for Confidentiality

At the initial meeting with the athletes prior to the tournament, the investigator explained the judokas' rights as subjects (see Appendix D). They were reminded that participation was voluntary and not required and that no effort would be made to identify individual subjects in the data analysis, presentation of results and discussion. Although the subjects' names were on questionnaires, confidentiality was insured by the erasure of names once the data were placed into the computer. In addition, the information given by the subjects did not place a subject at risk nor did the survey deal with sensitive aspects of the subject's own behavior.

Data Collection

At the initial meeting, testing procedures were explained and demographic information was collected from all

but one subject (see Appendix E). At the tournament itself the investigator assessed anxiety levels by administering the ICJ immediately 5-10 minutes prior to and immediately 5-10 minutes following each match. For each specific match, 3 testers collected the data at each match area. A tester collected pre/post CSAI-2 data for one subject, another collected the same data for the opponent. The third tester collected the results of the tournament performance written on the placard of scores. At each match area, one person guided the athletes to the tester's table prior to and after every match. A total of 8 people worked to collect these data (see Appendix F).

Data Analyses

Appropriate statistical analyses are indicated for each hypothesis in the results section. The .05 level of significance was chosen for the analyses using inferential statistics procedures based on the fact that it is the most common probability used in the sport psychology literature which focuses on anxiety.

CHAPTER 4

RESULTS AND DISCUSSION

The purpose of this study was to examine the relationship between performance and patterns of anxiety of judo athletes. Specifically the investigator used a multidimensional anxiety scale, the ICJ, to measure levels of anxiety immediately prior to and right after competition as judokas progressed through an important tournament. The results of descriptive and inferential statistical procedures used to describe the relationship will be reported as well as a discussion of those results.

Properties of the ICJ

1. Reliability

Reliability was determined for each dimension with the use of Cronbach's alpha. Match 1 data were used for this analysis. The results are given in Table 2. The alpha coefficients ranged from a low of .77 for pre cognitive anxiety to a high of .88 for post self-confidence.

Table 2
Reliability Analysis of Pilot and Sample Study

Scale	Pilot[a]	Sample[b] Pre*	Post*
Cognitive	.80	.77	.83
Somatic	.80	.86	.85
Self-confidence	.83	.82	.88

[a] $n = 97$, [b] $n = 70$

* match 1

Most of the coefficients were higher than .80. On the basis of these data and those of the pilot study, the ICJ was judged to have acceptable internal reliability.

2. Construct Analysis

A factor analysis was performed on prematch 1 ICJ scores. The only factors examined were those with eigenvalues greater than or equal to 1.0. Items with loadings equal to or greater than .40 were used to delineate factors.This analysis generated 7 meaningful factors. The results are given in Table 3 and are arranged according to the content of the constructs as defined by Martens et al. (1983) (cognitive anxiety, somatic anxiety and self-confidence). In the current study, the investigator found that the cognitive, somatic and self-confidence factors explained

13.7%, 42.1% and 11.9% respectively of the variance of the ICJ.

Table 3
Factor Analysis of ICJ[a]

Items	Factor Loading[b] Somatic (1)	(2)	Self-Confidence (3)	(4)	Cognitive (5)	(6)	(7)
2	.83	-	-	-	-	-	-
8	.80	-	-	-	-	-	-
1	.71	-	-	-	-	-	-
17	.58	.56	-	-	-	-	-
23	.51	.40	-	-	-	-	-
5	.48	-	-	-	.52	-	-
13	.49	-	-	-	-	-	.62
7	.41	-	-	-	-	-	.44
20	-	.84	-	-	-	-	-
11	-	.77	-	-.48	-	-	-
26	-	.55	-	-	-	-	-
21	-	-.52	.41	-	-	-	-
10	-	.39	-	-	-	-	-
14	-	.40	.68	-	-	-	-
3	-	-	-.73	-	-	-	-
12	-	-	.61	-	-	-	-
6	-	-	.60	-	.44	-	-
27	-	-	.56	-	-	-	-
18	-	-	.48	-	-	-	-.45
9	-	-	.52	-	-	-	-.59
15	-	-	-	.78	-	-	-
24	-	-	-	.65	-	-	-
25	-	-	-	-.59	.42	-	-
22	-	-	-	-.58	-	-	-
4	-	-	-	-	.77	-	-
19	-	-	-	-	-	.85	-
16	-	-	-	-	-	.50	-
Eigenvalue	8.37	3.00	1.71	1.48	1.33	1.24	1.14
% variance	31.00	11.10	6.40	5.50	4.90	4.60	4.20

[a] Correlations among the constructs are given in Table 5.

[b] This first analysis produced 7 factors.

Since no construct was defined by a single factor and since the seven factors explained 67.7% of the variance, the investigator conducted a forced factor analysis with 3 factors (see Table 4).

Table 4
Forced Factor Analysis of ICJ (3 factors)

Items	Factor Loading Somatic (1)	Self-Confidence (2)	Cognitive (3)
1	.72	-	-
2	.74	-	-
5	.42	-	-
7	.57	-	-
8	.87	-	-
10	.59	-	-
13	.53	-	-
23	.63	-	-
3	-	.68	-
6	-	.69	-
9	-	.71	-
12	-	.64	-
18	-	.62	-
27	-	.64	-
15	-	-	-.57
22	-	-	.64
25	-	-	.65
11	.52	-	.40
14	.45	.49	-
16	.53	-	.43
17	.73	-	.42
19	.31	.21	.04
20	.41	-	.59
21	-.42	.36	-.38
24	-	-	-.49
26	.47	-	.70
4		-.36	
Eigenvalue	3.00	8.37	1.71
% variance	11.10	31.00	6.40

These 3 factors explained only 48.5% of the total variance. Factor 1 explained 31.0% of variance and was similar in content to Martens et al. (1983) somatic anxiety dimension. Factor 2 explained 11.1% of variance and was similar in content to Martens et al. (1983) self-confidence dimension, Factor 3 explained 6.4% of variance and was similar in content to Martens et al. (1983) cognitive anxiety.

Although these results explained less of the variance than did those of the previous factor analysis, the investigator based his subsequent data analyses on the latter analysis, that is, the constructs as defined by Martens et al. (1983). This approach was justified by the lack of clarity of the seven original factors and by the need to compare these data with the results of other studies which were grounded in the dimensions as defined by Martens et al. (1983). An analysis of the relationships among the three constructs showed that cognitive and somatic anxiety were highly correlated while self-confidence was only moderately and negatively related to the other two constructs. Table 5 shows the correlations.

Table 5

Correlations Across Pre Anxiety Dimensions by Match

	Prematch			
	Cognitive with		Somatic with	
	Somatic	Confidence	Cognitive	Confidence
Match 1	.74**	-.48**	.74**	-.35*
Match 2	.71**	-.38*	.71**	-.42*
Match 3	.72**	-.09	.72**	-.04

** $p < .001$

* $p < .002$

Descriptive Statistics of Subject Scores

The ICJ was administered prior to and after the five matches. The results indicated that the overall prematch self-confidence mean score was 24.19, cognitive anxiety mean score was 18.43 and somatic anxiety mean score was 17.91. Post match self-confidence mean score was 25.14, cognitive anxiety mean score was 17.22 and somatic anxiety mean score was 17.74 (see Table 6).

Table 6
Means and Standard Deviations Across 5 Matches

	Match 1				
	Pre		Post		
	M	SD	M	SD	N
Cognitive	19.28	4.92	18.72	5.92	70
Somatic	20.97	6.09	19.32	5.90	70
Confidence	23.74	5.31	23.65	6.52	70

	Match 2				
	Pre		Post		
	M	SD	M	SD	N
Cognitive	18.50	5.48	16.98	5.56	52
Somatic	19.01	6.21	18.66	6.46	52
Confidence	23.55	6.23	24.69	6.42	52

	Match 3				
	Pre		Post		
	M	SD	M	SD	N
Cognitive	18.36	5.23	15.90	5.56	22
Somatic	18.18	5.65	18.04	6.05	22
Confidence	23.45	6.27	25.54	7.59	22

	Match 4				
	Pre		Post		
	M	SD	M	SD	N
Cognitive	20.00	6.96	20.00	7.03	5
Somatic	17.40	7.47	17.20	6.90	5
Confidence	25.20	4.38	25.80	3.11	5

	Match 5				
	Pre		Post		
	M	SD	M	SD	N
Cognitive	16.00	0.00	14.50	2.12	2
Somatic	14.00	1.41	15.50	2.82	2
Confidence	25.00	1.41	26.00	1.41	2

The results of data analyses are presented with their appropriate hypotheses. Since the data were collected at a tournament, the number of judokas in each round decreased as the tournament progressed. This drop in numbers precluded using all matches for each statistical analysis. The number of matches used in an analysis depends on the type of analysis as well as the number and type of independent variables.

Hypothesis 1:

a) State anxiety (cognitive, somatic and self-confidence across 3 matches) is a significant predictor of performance.

Three full model regression analyses were performed to determine if pre and post match scores of the 3 dimensions of state anxiety were a significant predictor of match performance. The small number of subjects who participated in matches 4 and 5, precluded the use of a regression procedure for those matches. The prematch 1 anxiety scores comprised the independent variables in the analysis. In the second analysis post match 1 and prematch 2 scores served as the independent variable. In the third analysis post match 2 and prematch 3 scores served as the independent variable. Performance served as the dependent variable in each analysis. The results are given in Table 7 and indicated that the hypothesis was rejected since none

of the variables were significant predictors of performance .

Table 7
Three Full Model Regression Analyses to Predict Performance

Dependent Variable	Independent Variable	Standardize Beta Coefficient
Performance Match 1	(df = 3,66)	
	Prematch 1 Cognitive	.053
	Prematch 1 Somatic	-.009
	Prematch 1 Self-confidence	.034
	R	.043
	R^2	.001
	F	.041
Performance Match 2	(df = 6,49)	
	Post match 1 Cognitive	.036
	Post match 1 Somatic	.133
	Post match 1 Self-confidence	.449
	Prematch 2 Cognitive	-.084
	Prematch 2 Somatic	-.521
	Prematch 2 Self-confidence	-.308
	R	.36
	R^2	.132
	F	1.24
Performance Match 3	(df = 6,15)	
	Post match 2 Cognitive	.305
	Post match 2 Somatic	-.013
	Post match 2 Self-confidence	.770
	Prematch 3 Cognitive	-.667
	Prematch 3 Somatic	.145
	Prematch 3 Self-confidence	-.504
	R	.51
	R^2	.26
	F	.89

b) Performance is a significant predictor of state anxiety (cognitive, somatic and self-confidence across 3 matches).

Since for each analysis there was one independent variable and one dependent variable, univariate regression analyses were performed to determine if performance was a significant predictor of each pre and post of the 3 dimensions of state anxiety. Each dimension served as the dependent variable for an analysis while performance was the independent variable. The results in Table 8 indicated that performance was a significant predictor only of post self-confidence scores, ($F(1,20)=5.27$, $p<.03$) on match 3. Performance accounted for 21% of the variance in post self-confidence. Therefore, the hypothesis was partially accepted.

Table 8
Full Model Regression Analysis to Predict Anxiety from Performance

Dependent Variable	Standardize Beta Coefficient	R	R^2	F
Prematch 1				
Cognitive	.030	.029	.000	.06
Somatic	.020	.015	.000	.02
Self-confidence	.014	.013	.000	.01
Post match 1				
Cognitive	-.114	.091	.008	.57
Somatic	-.074	.060	.003	.24
Self-confidence	-.212	.154	.023	1.65
Prematch 2				
Cognitive	-.114	.097	.009	.51
Somatic	-.337	.252	.063	3.67
Self-confidence	.261	.195	.038	2.13
Post match 2				
Cognitive	-.125	.104	.010	.60
Somatic	-.294	.211	.044	2.52
Self-confidence	.319	.230	.053	3.03
Prematch 3				
Cognitive	-.307	.253	.064	1.37
Somatic	-.084	.069	.004	.09
Self-confidence	.210	.144	.021	.42
Post match 3				
Cognitive	-.223	.172	.030	.61
Somatic	-.402	.286	.082	1.79
Self-confidence	.805	.456	.208	5.27*

* F (1,20) = 5.27, p < .03

Hypothesis 2:

a) Prematch cognitive anxiety scores and self-confident scores will remain stable while prematch somatic anxiety scores will show a significant increase across five matches.

Three separate one-way ANOVAs were performed to examine differences among the means. Each of the constructs served as dependent variable while match performance (1-5) was the independent variable. The means are presented in Table 6 and F values in Table 9 and revealed that none of the F values were significant. Thus, none of the scores of prematch anxiety dimensions changed significantly during the tournament and the hypothesis was partially rejected.

b) Post cognitive and somatic anxiety scores will show a significant decrease while post match self-confidence scores will show a significant increase across five matches.

Three separate one-way ANOVAs were performed. Each of the constructs served as a dependent variable while match performance (1-5) was the independent variable. The results are presented in Table 9 and revealed that none of the F values were significant. Thus, none of the scores of post match anxiety dimensions changed significantly during the tournament and the hypothesis was partially rejected.

Table 9
F values for Anxiety Across 5 Matches*

	Pre-Match F values	Post Match F values
Cognitive	.40	1.66
Somatic	1.59	.39
Self-confidence	.13	.51

*$p > .05$, n = 155, df = 4,150

Hypothesis 3:

a) The level of cognitive and somatic anxiety scores immediately after a win match will be significantly higher while the level of self-confidence scores will be significantly lower than that immediately prior to the next match.

The results of the three t-tests (see Table 10) indicated that none of the pairs of means were significantly different. Therefore, the hypothesis was rejected.

Table 10
Comparison Between Anxiety of Winners*
(Matches 1 and 2).

	Winners				
	Post match 1		Prematch 2		
	M	SD	M	SD	t^a
Cognitive	18.69	5.42	18.62	6.33	-.14
Somatic	19.14	5.74	19.14	6.27	.00
Self-confidence	24.24	6.19	23.72	7.21	-.78

* $p > .05$
[a] $df = 28$

b) The level of cognitive and somatic anxiety scores immediately after losing a match will be significantly higher while the level of self-confidence scores will be significantly higher than that immediately prior to the next match.

The results of the three t-tests (see table 11) indicated that none of the pairs of means were significantly different. Therefore, the hypothesis was rejected.

Table 11
Comparison Between Anxiety of Losers*
(Matches 1-2)

	Losers				
	Post match 1		Prematch 2		
	M	SD	M	SD	t^a
Cognitive	19.59	6.06	18.37	18.37	-1.72
Somatic	19.37	6.47	18.89	18.89	-0.84
Self-confidence	22.96	5.89	23.37	23.37	0.61

* $p > .05$
[a] $df = 26$

Hypothesis 4:

Winners will have a lower post match mean cognitive scores and post match somatic anxiety scores and higher post match self-confidence scores than losers.

Three one-way ANOVAs were used to test this hypothesis. In each case the post match anxiety construct served as the dependent variable. Results in table 12, showed that there were no significant differences in mean post match cognitive and post match somatic anxiety scores while winners post match self-confidence scored significantly. Therefore, the hypothesis was partially supported.

Table 12
Comparison of Means and Standard Deviations of Winners and Losers Across 5 Matches.

	Post Match				
	Winners		Losers		
	M	SD	M	SD	F
Cognitive	17.06	5.42	18.33	6.15	1.84
Somatic	17.72	5.04	19.26	5.90	2.86
Self-confidence	25.89	6.14	22.84	6.57	8.95*

* F (1, 153) = 8.94, p <.003

Hypothesis 5:

a) There will be a significant difference in pre/post test scores of match 1 for each of the three dimensions of anxiety (cognitive, somatic and self-confidence) among males.

Three t-tests were conducted to test significance of mean differences in the 3 dimensions of anxiety across match 1. Support for the hypothesis was found only for somatic dimension ($t(42) = 2.62$ $p<.05$) as shown in Table 13. Thus, the hypothesis was partially accepted.

b) There will be significant differences in pre/post test scores of match 1 for each of the three dimensions of anxiety (cognitive, somatic and self-confidence) Among females.

Three t-tests were conducted to test significance of mean differences in the 3 dimensions of anxiety across

match 1 (Table 13). No support for the hypothesis was found ($p > .05$). Thus, the hypothesis was rejected.

Table 13
Means and Standard Deviations for Males and Females Across Match 1

	Pre match M	Pre match SD	Post match M	Post match SD	t
Male[a]					
Cognitive	18.58	4.23	17.98	5.07	1.04
Somatic	20.07	5.57	18.56	5.40	2.62 *
Self-confidence	24.93	5.55	25.07	6.33	-.20
Female[b]					
Cognitive	20.41	5.78	19.93	7.01	.70
Somatic	22.41	6.72	20.56	6.54	1.84
Self-confidence	21.85	4.39	21.41	6.30	.42

* t (42) = 2.62, p <.05

[a] df = 42

[b] df = 26

Hypothesis 6:

a) Males will have a significantly lower prematch mean cognitive and prematch somatic anxiety scores and higher prematch mean self-confidence scores than will females.

Three one-way ANOVAs were used to test this hypothesis. In each case the prematch anxiety constructs were the dependent variables while gender served as the independent variable. As table 14 indicates, the results showed only partial support for the hypothesis. Specifically, there were no significant gender differences in mean prematch cognitive and prematch somatic anxiety scores while males scored significantly ($F(1,68) = 5.95$, $p<.02$) higher on prematch self-confidence scores than did females.

b) Males will have a significantly lower post match mean cognitive and post match somatic anxiety scores and higher post match mean self-confidence scores than will females.

Three one-way ANOVAs were used to test this hypothesis. In each case the post match anxiety constructs were the dependent variables while gender served as the independent variable. As table 14 indicates, the results showed only partial support for the hypothesis. Specifically, there were no significant gender differences in mean post match cognitive and somatic anxiety scores while males scored significantly ($F(1,68) = 5.56$, $p<.02$) higher on post match self-confidence scores than did females.

Table 14
Comparison of Gender Across Match 1 Pre Post Test.

	Male		Female		
	M	SD	M	SD	F
Prematch					
Cognitive	18.58	4.23	20.41	5.78	2.32
Somatic	20.07	5.57	22.41	6.72	2.40
Self-confidence	24.93	5.55	21.85	4.39	5.95 *
Post Match					
Cognitive	17.98	5.07	19.93	7.01	1.81
Somatic	18.56	5.40	20.56	6.54	1.92
Self-confidence	25.07	6.33	21.41	6.30	5.56 **

* F (1,68) = 5.95, p <.02

** F (1,68) = 5.56, p <.05

DISCUSSION

The purpose of this study was to investigate the relationship between performance and patterns of anxiety of judo athletes. Specifically,the investigator (1) used a multidimensional scale, the ICJ, to measure levels of anxiety across five matches, immediately prior to, and right after five matches competition, and (2) obtained information about pattern of sport related anxiety in another culture.

Levels of Anxiety

The overall mean of prematch cognitive anxiety (M = 18.43) of judokas was higher than the overall mean pre match of golfers (M = 18.9), of wrestlers (M = 17.19) and of gymnasts (M = 17.26) and lower in prematch self-confidence (M = 24.19) when compared with that of golfers (M = 25.99), of high school wrestlers (M = 24.60) and of gymnasts (M = 24.79) found in the study done by Martens et al., (1983). The judokas also scored high prematch overall mean cognitive anxiety than golfers (M = 17.58) and lower self-confidence than golfers (M = 26.06) reported by Krane and Williams, (1987). These results, with the exception of the results of wrestlers, seemed congruent with findings of Martens et al., (1983), Simon and Martens (1979), and Borkovec (1976), who stated that contact sports tend to elicit higher state anxiety than noncontact sports. These results also confirmed those of researchers (Oxendine, 1970, Weinberg & Genuchi, 1980, Landers, 1980) who reported that tasks that require a high degree of physical exertion (e.g., weight lifting, sprinting, football-defense) athletes are enhanced by a relatively high degree level of anxiety. Since judo requires a large amount of energy these findings may explain why judokas reported a higher anxiety scores when compared with golfers and gymnasts in this study.

To what extent do performance and anxiety scores predict each other? Anxiety scores did not significantly predict performance, contrary to findings by Highlen and Bennett, 1979; Weinberg and Genuchi, 1980. However, self-confidence (post match 3) was significantly related to performance and performance significantly predicted post match 3 self-confidence. The performance scores were a significant predictor of post match 3 self-confidence scores. This result seems to partially support the findings of McAuley (1985) who found golf performance to be a significant predictor of post cognitive anxiety and post self-confidence. Martens et al., (1983) found the mid competition scores correlating significantly on all three CSAI-2 subscales, which correlated with both performance scores 1 and 2. These two results suggested that the athletes gain confidence as they go through the tournament and win. For each match a history of good performances is needed to increase confidence. It is possible that the self-confidence of these judokas needed a history of successful performances before it became significantly related to performance. Specifically, three matches were needed to develop this significant relationship.

Patterns of Anxiety

Differences across matches - Prematch cognitive anxiety and self-confidence scores remained stable across matches.

These results were similar to those found by other researchers (Martens et al., 1983; Gould et al., 1984). Unlike those in previous cited sources, however, prematch somatic scores did not increase across matches in the current study. Also, no significant changes were found in any of the three post subscales across matches. In summary, no significant differences were found for both pre and post anxiety scores across all matches. One factor that might have influenced these results was the data collection protocol. Several subjects had to fill out the questionnaires right after competition. They then completed the prematch questionnaires for the next match, 5 to 10 minutes later. This short time interval between almost every match might have affected the answers of the athletes. They may simply have repeated their answers of the previous test.

There are two other possible explanations for the lack of significance. First, anxiety as measured by the ICJ did not manifest itself in performance, that is, these constructs of anxiety may not have been salient to Brazilians. This possibility will be discussed later on. The other explanation for the lack of significance is related to the control of anxiety. The anxiety of judokas might be purposely mentally controlled since judo is a martial art where codes of self-conduct and behavior called "Bushido" (Code of Honor) are emphasized as part of every day training. Some of these skills include relaxation, massage after training and some techniques of zen before

competition. The extent to which these skills are taught may have varied by club and by instructor. Therefore, judokas may have been taught mental preparation in order to control anxiety.

Winners vs losers - A series of t-tests were performed to determine if any differences existed in anxiety scores between these two groups. Analyses of the scores of winners and also of losers indicated no significant differences. However, when the results of winners and losers were compared, winners scored higher than losers in post match 3 self-confidence. These results lend credence to the earlier suggestion that perhaps as a tournament progresses, winners develop more self-confidence and losers less. This partially confirmed results of research done by Mahoney and Avener (1977), Highlen and Bennett (1979, 1983), Meyers et al. (1979), and Weinberg and Genuchi (1980) and substantiated the first hypothesis which showed that performance and self-confidence were related to each other.

Males vs females - The males increased significantly in prematch somatic anxiety scores, but showed stability in prematch cognitive and prematch self-confidence scores. This was similar to previous research findings (Martens et al., 1983; Gould et al., 1984). The significant difference in prematch somatic anxiety scores may have been due to the ecology of the setting and the situation. The presence of an audience, the importance of the match, the presence of noise, etc., may have been reflected directly in the male

athletes' emotionality. On the other hand, cognitive anxiety and self-confidence may have been dependent on the athletes' perception of their ability, past experience, next opponent, etc. These two constructs may have manifested themselves more internally than externally. In addition, Borkovec (1967) stated that these perceptions are typically manifested only after a competition begins.

The females however did not show any significant change across the matches so perhaps any explanation is gender specific. A comparison of all matches across gender showed that males scored significantly higher than females on both pre and post match 1 self-confidence. Female athletes may have perceived the competition to be more threatening than males perhaps due to their age and belt level. Females tended to be younger and have lower belt classifications. This suggests that males had more skill and experience than females. This lack of skill and experience may have inhibited self-confidence scores of females. Several female athletes made informal comments that they needed to compete more frequently in order to learn how to understand and deal with stress during the competition. It is also possible that females might have answered the self-confidence related questions more accurately. Perhaps the scores of males reflected over-confidence.

Two other possible reasons for gender differences in self-confidence might be related to the perceived lack of acceptance of female judokas by many people. In answer to

the question: "How do people react when they hear that you train and compete in judo?", 63% (n = 17) of female athletes answered by stating that many people felt that judo was too violent for women and that women should participate in other activities such as dance or ballet, 26% (n = 7) of female athletes responded that people approved of their participation in judo competition, and, 11% (n = 3) of female athletes did not express any opinion about it. In contrast 37% (n = 16) of male athletes declared that people are very curious about judo, 33% (n = 14) of male athletes answered that people respect judo as a very important sport, 12% (n = 5) of male athletes answered that people do not give any importance for this type of sport, 9% (n = 4) of male athletes answered that people understand judo as a formative sport for the participants, 7% (n = 3) of male athletes reported that judo was very important for the body and the moral of the participants, and 2% (n = 1) of male athlete did not understand the question. These gender specific opinions about the perceived support for participation in judo competition might have had a gender-differentiated impact on how both judo and the tournament were experienced. Consequently, female athletes may have had to deal with both the challenges of the competition and with peoples' reaction to them as female judokas. These factors might have influenced their self-confidence. Further research is needed to determine which of these explanations is most accurate.

How did Brazilian athletes perceive anxiety? - The results of the factor analyses showed that Brazilian athletes may have perceived the ICJ in a different manner than did the samples which Martens et al. (1983) used to validate the CSAI-2. Somatic anxiety and self-confidence in a combination of 4 factors explained 54% of the first factor analysis and 41.1% from 3 combined factors in the second one. However, cognitive anxiety in a combination of factors in each set of factor analysis explained only 13.7% and 6.4% respectively. In addition, the magnitude of the correlations among the constructs indicated that somatic and cognitive anxiety were not independent constructs while self-confidence was independent from the other two. Other researchers (Gould et al., 1984; Martens et al., 1983; McAuley, 1985), have found all three constructs to be independent, that is only moderately related with a correlation <.50 (Gill & Karteroliatis, 1987).

Part of this difference in perception may have been due to the manner in which the CSAI-2 was translated into ICJ. The translation was a literal one which may have reduced the validity of the test. Translation of expressions such as "I feel," "I am concerned" and "I feel mentally" need to be reviewed in order to assure the semantic equivalence of the CSAI-2 in Portuguese. Other translation differences may have been due to the difficulty in finding idiom equivalencies of such words as "jittery" and "stomach sinking" which the subjects may have perceived differently from the intent of

the original construct. Possibly too, the American and Brazilian societies differ in their perception or expression of and experience of anxiety. Anxiety as defined in the CSAI-2 may reflect the manner in which it is perceived and experienced by Americans; that definition may not be salient to Brazilians. If anxiety is a culture-bound concept, then a different instrument to assess anxiety needs to be developed for the Brazilian population.

Summary

Self-confidence was correlated but not a significant predictor of performance. However, performance was a significant predictor of post self-confidence. No significant changes were found in the three anxiety constructs across five matches. This lack of change may have been due to both the short period of time between matches and to cultural artifacts. Another explanation located this lack of significance in the training regimen of judokas.

Winners were observed to have higher self-confidence scores when compared with losers, and these results seemed to corroborate those of other researchers. In addition to this, male prematch cognitive anxiety scores and prematch self-confidence scores remained stable while prematch somatic anxiety scores increased on match 1. These results were also confirmed by the literature and could have been due in part to audience effects. Finally, males had higher

pre and post match self-confidence scores than did females on match 3, which may have been related to the females' lesser degree of experience and to the lack of perceived congruency between being a female and a judoka.

Recommendations

The following recommendations for future research were drawn from the results of this study:

1. Since the salience of socially constructed constructs such as anxiety may be specific to a culture, tests of such constructs may have to be created for that culture. Such culture-specific construction should result in instruments which have ecological validity. The translation of an American instrument into another language may result in a questionnaire which may be linguistically correct but culturally invalid.
2. In order to avoid certain procedural problems, researchers should pay attention to the time between matches before using anxiety tests throughout a tournament especially in sports such as judo, karate, wrestling, etc., where the athletes are fighting many matches with little time in between. Thus, a required standardized minimum time interval between matches might increase the independence of each set of scores.

If such a minimum cannot be guaranteed then perhaps the questionnaire should not be administered throughout the tournament.

3. This study seemed to indicate that self-confidence was an important construct. Thus, future research should attempt to measure and to clarify its relation to performance as well as to antecedents.
4. More research should be directed toward measuring anxiety levels of females in order to better understand their stress and to allow researchers and athletes to develop strategies to cope with it.
5. More research should be attempted to assess the CSAI-2 and subscales during competition rather than pre or post measures in order to avoid methodological problems. State anxiety could possibly fluctuate in opposite directions during a competition. An athlete can be very nervous most of the time during an important event and close to the end of the match and then that level may drop drastically after a victory. Therefore, the scores on the test might have represented different levels of anxiety before, during, and after the game. An assessment during competition might, however, be problematic because it could interfere with the match itself. It seems unlikely that most coaches and athletes would permit such an

intrusion. Therefore, unobtrusive measures of state anxiety would need to be developed if anxiety were to be measured during competition.

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APPENDICES

APPENDIX A

Competitive State Anxiety Inventory-2 (CSAI-2) (English and Portuguese)

Competitive State Anxiety Inventory (CSAI-2)

Martens et al.'s (1983) CSAI-2 measures individuals levels of state anxiety in a given specific situation. The 27-item CSAI-2 scales consist of 3 sub-scales (cognitive, somatic, self confidence) where each consist in 9 items with scores ranging from 9 to 36. The higher score on the sub-scales the higher of the levels individuals state anxiety. The point scale used for all items is:

not all = 1
somewhat = 2
moderately = 3
very much so = 4

- The item 14 scores are reversed.
- The items 1, 4, 7, 10, 13, 16, 19, 22, 25 are cognitive anxiety measures.
- The items 2, 5, 8, 11, 14, 17, 20, 23, 26 are somatic anxiety measures.
- The items 3, 6, 9, 12, 15, 18, 21, 24, 27 are self confidence anxiety measures.

Competitive State Anxiety Inventory-2

(CSAI-2)

Directions: A number of statements which 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 All	Somewhat	Moderately So	Very Much 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 worried 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
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

Inventario de Competicao de Judo
(ICJ)

Instrucoes: Varias afirmativas usadas por atletas para descrever seus sentimentos antes de competir estao numeradas abaixo. Leia cada afirmativa e faca um circulo em torno do numero a direita que mais appropriadamente indica como voce se sente agora. Nao ha respostas certas ou erradas. Nao gaste muito tempo em cada afirmacao mas escolha a resposta que melhor expresse seu estado de espirito neste exato momento.

	nem um pouco	um pouco	moderadamente	muito
1. Eu estou preocupado com esta competicao	1	2	3	4
2. Sinto-me nervoso	1	2	3	4
3. Sinto-me calmo	1	2	3	4
4. Sinto-me indeciso	1	2	3	4
5. Sinto-me irriquieto	1	2	3	4
6. Sinto-me a vontade	1	2	3	4
7. Eu tenho preocupacao quanto a nao me sair bem na competicao como poderia	1	2	3	4
8. Eu estou tenso	1	2	3	4
9. Sinto-me confiante	1	2	3	4
10. Eu estou preocupado em perder	1	2	3	4
11. Eu sinto que meu estomago esta contraido	1	2	3	4
12. Eu me sinto seguro	1	2	3	4
13. Eu estou pensando que talvez "trema" sob pressao	1	2	3	4
14. Meu corpo esta relaxado	1	2	3	4
15. Eu estou confiante que posso enfrentar essa disputa	1	2	3	4
16. Eu estou preocupado que possa atuar "mal"	1	2	3	4
17. Meu coracao esta "acelerado"	1	2	3	4
18. Eu estou confiante quanto a atuar bem	1	2	3	4
19. Eu estou preocupado em alcancar o meu objetivo	1	2	3	4
20. Eu sinto um "vazio" em meu estomago	1	2	3	4
21. Sinto-me mentalment tranquilo	1	2	3	4
22. Eu estou preocupado que os outros ficarao desapontados com o meu desempenho	1	2	3	4
23. Minhas maos estao umidas (suando)	1	2	3	4
24. Eu estou confiante porque mentalmente vejo-me atingindo o meu objetivo	1	2	3	4
25. Estou preocupado que nao serei capaz de concentrar	1	2	3	4
26. Eu sinto meu corpo "amarrado" (Comprimido)	1	2	3	4
27. Eu estou confiante que me sairei bem sob pressao	1	2	3	4

APPENDIX B

Bracket and Score Sheets

Scoring (Performance)

The performance of Judokas was measured by three judges. Each throw was scored according to the International Judo Federation procedures as show below:

Koka = 3 points

Yuko = 5 points

Wazari = 7 points

Ipon = 10 points

Note: 1. Only for this present study the researcher included 1 point for cases such as forfeits or accidents.

2. The losers were scored equal 0.

(Minas Gerais Judo Federation)

FEDERAÇÃO MINEIRA DE JUDÔ

COMPETIÇÃO	(Competition Name)	CATEGORIA	(Category)
LOCAL	(Place)	DATA	(Date)

N.º	NOME		N.º	NOME
	(Name)	X		

MARCAÇÕES (Pontuations)

KOKA	YUKO	WAZARI		KOKA	YUKO	WAZARI
SHIDO	CHUI	KEIKOKU	X	SHIDO	CHUI	KEIKOKU

VENCEDOR (Winner)

N.º	FED.	NOME	TEMPO (Time)	RESULT. (Result)	PT.º (Points)

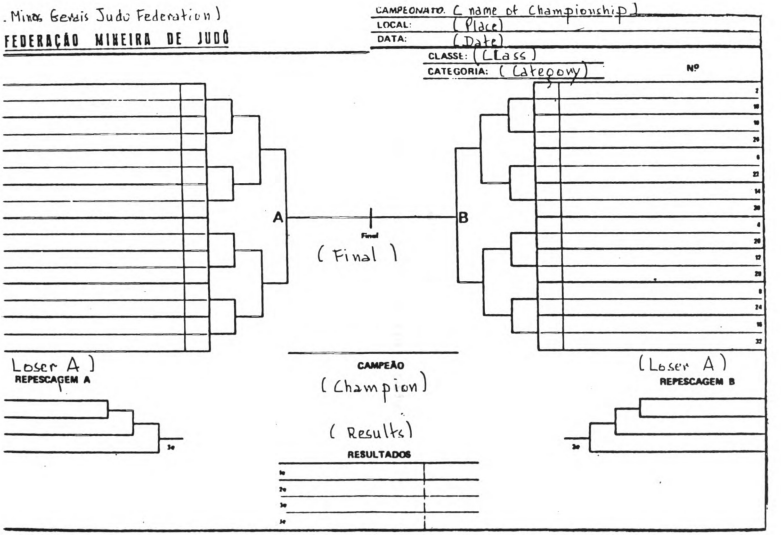
Convenções: (Convention) ○ Ippon △ Wazari □ Yusei-gachi

JUIZES: (Judges)

(Minas Gerais Judo Federation)

FEDERAÇÃO MINEIRA DE JUDÔ

CAMPEONATO: (name of Championship)
LOCAL: (Place)
DATA: (Date)
CLASSE: (Class)
CATEGORIA: (Category)



APPENDIX C

Consent for Conducting the Study

MICHIGAN STATE UNIVERSITY 83

UNIVERSITY COMMITTEE ON RESEARCH INVOLVING
HUMAN SUBJECTS (UCRIHS)
238 ADMINISTRATION BUILDING
(517) 355-2186

EAST LANSING • MICHIGAN • 48824-1046

June 2, 1987

Mr. Luiz Carlos Moraes
1629F Spartan Village
East Lansing, Michigan 48823

Dear Mr. Moraes:

Subject: Proposal Entitled, "Anxiety and Performance of Male and Female Brazilian Judo Athletes"

I am pleased to advise that I concur with your evaluation that this project is exempt from full UCRIHS review, and approval is herewith granted for conduct of the project.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval prior to June 2, 1988.

Any changes in procedures involving human subjects must be reviewed by the UCRIHS prior to initiation of the change. UCRIHS must also be notified promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to my attention. If I can be of any future help, please do not hesitate to let me know.

Sincerely,

Henry E. Bredeck, Ph.D.
Chairman, UCRIHS

HEB/jms

cc: Dr. Annelies Knoppers

APPENDIX D

Introductory Letter and Consent Corm (English and Portuguese)

To Prof.
Antonio de Oliveira Costa
President of Minas Gerais State Judo Federation
Belo Horizonte - MG
BRASIL

Dear Mr. Costa.

One of the main questions of many coaches and athletes in Brazil is how to manage anxiety during a competition. Little research has been done on the levels of anxiety of Brazilian athletes. This study will be pioneer and the first step in answering many of the questions involving anxiety levels related to performance, and how to cope with them. In addition, more information will be available to understand cross-cultural relationship between anxiety-performance and its importance on performance.

For this study all judo competitors attending the Minas Gerais State Judo Championship (junior and senior), sponsored by the Minas Gerais Judo Federation, at June 13 and 29 of this year will be asked to complete a short questionnaire concerning background information and another one of how the individual feels in the moment and during the competition. This will take about 5-10 minutes of the competitors time before and after each match. In addition, we would like to ask the coaches to rate their athletes performance.

The responses will be strictly confidential and the athletes' identity will remain anonymous. The code numbers on the top of each questionnaire to classify each competitor will be assessed to protect the identification of each athlete and coach.

If you agree to participate in this study please complete the "Informed Consent." Also, please ask the athletes and the coaches to complete the inform consent form which provides a summary of the athletes and coaches' rights as participants in the study. There is no penalty if at any time you, the coach or the athlete does not whish to participate or fail to complete the questionnaire.

Sincerely,

Luiz Carlos Moraes
Researcher

Dr. Annelies Knoppers - Associate Professor Michigan State University - Adviser

Anxiety/Performance Study

Consent Form
(Minas Gerais State Judo Federation)

I have received all the information concerning the participation of the Minas Gerais State Judo Federation, in the anxiety performance study being conducted by Luiz Carlos Moraes academic graduate student at Michigan State University. It is further understood that I have received the following information concerning the study and I authorized the administration of the questionnaire on June, 13 and 20 of 1987, during the Judo Competition,

_____ _____

Prof. Antonio de Oliveira Costa
Presidente da F.M.J.

data

Inventario de Competicao de Judo

Formulario de Consentimento
(Federacao Mineira de Judo)

Declaro que recebi todas as informacoes sobre a participacao da Federacao Mineira de Judo (F.M.J.) no estudo do Inventario de Competicao de Judo a ser conduzido por Luiz Carlos Moraes, estudante de pos-graduacao da Universidade do Estado de Michigan. Eu entendo que recebi as informacoes sobre este estudo e autorizo a administracao dos questionarios em 13 e 20 de junho de 1987, durante a competicao de judo.

_____ _____

Prof. Antonio de Oliveira Costa — data
Presidente da F.M.J.

Anxiety/Performance Study

Athlete Consent Form

I have received all the information concerning the participation in the anxiety performance study being conducted by Luiz Carlos Moraes academic graduate student at Michigan State University. It is further understood that I have received the following information concerning the study.

1. The study has been explained to me, I understand the explanation that has been given, and what my participation will involve.

2. My participation is completely voluntary.

3. I understand that I am free to discontinue my participation in this study at any time without penalty.

4. I understand that the results of the study will be treated in strict confidence and I will remain anonymous. Within restrictions, results of the study will be made available to me at my request.

5. I understand that, at my request, I can receive additional explanation of the study after my participation is completed.

_____ _____

Athlete signature date

_____

name

_____

address

_____

Inventario de Competicao de Judo

Formulario de Consentimento
(Atleta)

Declaro que recebi todas as informacoes sobre a participacao no estudo da ansiedade e performance a ser conduzido pelo Luiz Carlos Moraes, estudante da pos-graduacao da Universidade do Estado de Michigan. Eu entendo que recebi as seguintes informacoes sobre este estudo:

1. Eu recebi e entendi as explicacoes sobre o estudo e sobre a minha participacao neste estudo.

2. Minha participacao e completamente voluntaria.

3. Eu entendi que posso interromper a minha participacao neste estudo em qualquer hora sem nenhuma penalidade.

4. Eu entendo que os resultados do estudo serao tratados com estrita confidencia e que eu continuarei anonimo. Os resultados do estudo estarao a minha disposicao sem nenhuma restricao.

5. Eu entendo que apos completar a minha participacao, se quiser, receberei explicacoes adicionais sobre o estudo.

_____ _____

assinatura do atleta data

Por favor envie copia dos resultados para:

_____

nome

_____

endereco

Anxiety/Performance Study

Coaches Consent Form

I have received all the information concerning the participation in the anxiety performance study being conducted by Luiz Carlos Moraes academic graduate student at Michigan State University. It is further understood that I have received the following information concerning the study.

1. The study has been explained to me, I understand the explanation that has been given, and what my participation will involve.

2. My participation is completely voluntary.

3. I understand that I am free to discontinue my participation in this study at any time without penalty.

4. I understand that the results of the study will be treated in strict confidence and I will remain anonymous. Within restrictions, results of the study will be made available to me at my request.

5. I understand that, at my request, I can receive additional explanation of the study after my participation is completed.

_____ _____

Coach signature date

_____

name

_____

address

_____

Inventario de Competicao de Judo

Formulario de Consentimento
(Tecnico)

Declaro que recebi todas as informacoes sobre a participacao no estudo da ansiedade e performance a ser conduzido pelo Luiz Carlos Moraes, estudante da pos-graduacao da Universidade do Estado de Michigan. Eu entendo que recebi as seguintes informacoes sobre este estudo:

1. **Eu recebi e entendi as explicacoes sobre o estudo e sobre a minha participacao neste estudo.**

2. **Minha participacao e completamente voluntaria.**

3. **Eu entendi que posso interromper a minha participacao neste estudo em qualquer hora sem nenhuma penalidade.**

4. **Eu entendo que os resultados do estudo serao tratados com estrita confidencia e que eu continuarei anonimo. Os resultados do estudo estarao a minha disposicao sem nenhuma restricao.**

5. **Eu entendo que apos completar a minha participacao, se quiser, receberei explicacoes adicionais sobre o estudo.**

_____ _____

assinatura do tecnico **data**

Por favor envie copia dos resultados para:

_____

nome

_____

endereco

APPENDIX E

Demographic Questionnaire (English and Portuguese)

Demographic Questionnaire

Instrucoes: Please, answer all the questions below.

Name:_____**Belt:**_____

Date of birth:_____**Sex:**_____

At what age did you begin to compete?_____

List your best tournament classification_____

_____

How many judo classes do you normally take per week?

1, 2, 3, 4, 5, 6 or more:_____

How do people react when they hear that you train and compete in judo? Please explain/or give examples:

_____

_____

_____

_____

Questionario Demografico

Direcoes: Por favor responda as perguntas abaixo relacionadas.

Nome:_____Faixa:_____

Data de nascimento:_____Sexo:_____

A que idade voce comecou a competir?_____

Liste sua melhor classificacao:_____

Quantas aulas de judo voce pratica por semana?
1, 2, 3, 4, 5, 6 ou mais:_____

Como as pessoas reagem quando ficam sabendo que voce treina e compete no judo? Por favor explique ou de exemplos.

_____

_____

_____

_____

APPENDIX F

Diagram of Area of Competition

Area of Competition

Table A (Contains performance scores)		Table B (Contains performance scores)	
Competitive area 1		Competitive area 2	
(Athlete A)	(Athlete B)	(Athlete A)	(Athlete B)
1	1	1	1

Table of Testers:

A	B	C	D	E	F
(Pre/ Post)	(Pre/ Post)	(Perf.* Scores)	(Pre/ Post)	(Pre/ Post)	(Perf.* Scores)

OBS: 1 person for each area was responsible for guiding the athletes towards the testers' table prior and post after each match.

* Performance