A COMPARISON OF SENSATION SEEKING AND PERSONALITY MEASURES BETWEEN ROAD CYCLISTS AND MOUNTAIN BIKERS

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Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF PHILOSOPHY
December, 2000

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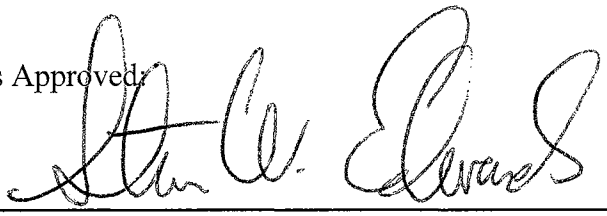
Thesis Approved:



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ACKNOWLEDGMENTS

I would like to express my gratitude to the chair of my Dissertation Committee, Dr. Steve Edwards, for his countless hours of direction, support, and mentorship through this process. Without his experience and counsel, this project might well have not been completed. Additionally, I would like to thank the other members of my committee, Dr. Katye Perry, Dr. Rocky Robbins, Dr. John Romans, and Dr. Carrie Winterrowd for their invaluable assistance and feedback throughout the various stages of this process. Each individual contributed unique insight, which assisted with the overall development of the dissertation.

I would also like to express my appreciation to the entire Counseling Psychology faculty and staff for their support. So many individuals contributed to the development of the study and to the task of bringing it along from conception to finished project, that there are too many names to mention.

Finally, and most importantly, I would like to thank my wife, Dana, for the years of love, support, and encouragement which kept me going through the whole endeavor that is graduate school. Without her involvement, I would not have finished, or had a reason to finish.

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CHAPTER I

INTRODUCTION

Overview of the Study

The discipline of sport psychology has examined the personality component of the athlete nearly since its inception. What makes the individual who is drawn to compete in sports different from the person who does not have any such desire, and why do some people choose one sport while others participate in another? These are questions, which are still the focus of ongoing research and debate today.

Perhaps the first research project in sport psychology was Triplett's investigation, in 1897, of the effects of competition on motor performance (Whelan, Mahoney, & Meyers, 1991). Triplett observed cyclists performing against the clock, against a standard, or against other cyclists in competition. As might be expected, the cyclists in competition with other opponents performed best, and Triplett's conclusion was that the presence of a competitor served to "liberate latent energy not ordinarily available" (Whelan et al., 1991). With this study and a few others, we now can identify what were the meager beginnings of the discipline of sport psychology.

Development in sport psychology proceeded slowly until the 1960s, when, in Rome, the First International Congress of Sport Psychology was held in 1965, and two years later, the North American Society for the Psychology of Sport and Physical Activity

was founded. The late 1960s saw Ogilvie and Tutko's attempt to integrate psychological assessment and personality theory in sport psychology (Mahoney, Gabriel, & Perkins, 1987). Their work marks the first modern meeting of psychology and the study of athletic performance. Ogilvie and Tutko concentrated their study on the development of a personality test that they hoped would allow them to predict the performance of athletes (Mahoney et al., 1987). Their theory purported that elite athletes in a given sport possess unique and definable personality attributes different from nonathletes, from athletes in other sports, and from athletes of lesser skill levels. The theory was largely unsupported by research findings, but led to a long exploration of the relationship between personality and sport performance.

Currently, thirty-some years later, the debate still exists over the idea that participation in sport and personality might be connected. Could it be that a person who participates in a particular sport is drawn to that sport based on his/her personality characteristics or could it be the opposite? Perhaps youthful participation in sport is a substantial determinant of personality development.

Background of the Problem

In recent years, interest in the psychology of sport activities has broadened to capture other physical activities like exercise and, thus, the discipline is referred to now as sport and exercise psychology. Study in exercise psychology has revealed many important constructs including exercise adherence and motivation to exercise. The past 15 to 20 years has seen an explosion of growth in the health and fitness industry (Davis, Fox, Brewer, & Ratusney, 1995) as the relationship between physical activity and dieting has

become more evident for the average citizen. A by-product of this heightened focus on health has been a media barrage of exercise and weight-loss methods (Rodin & Larsen, 1992). Seemingly in spite of efforts by health-care professionals to educate the public on the health benefits related to exercise, evidence suggests that the main motivation for exercising is aesthetic improvement (Koslow, 1988).

The attempt at aesthetic improvement through weight loss, has also been cited as an influential motive for beginning exercising, and women endorse this reason more often than men (Markland & Hardy, 1993). The goal associated with weight loss through exercising usually centers around achieving a certain look or target weight rather than lowering one's risk of heart disease or bettering one's overall fitness. Achieving the goal of better health may occur as an unintentional by-product of exercising for weight loss, but it is certainly not assured. Not surprisingly, exercising merely for weight loss has been positively correlated with the incidence of eating disorders among both women and men (McDonald & Thompson, 1992).

Deci and Ryan (1985), in their presentation of cognitive evaluation theory, discuss the motivations of individuals. According to this theory, "interpersonal events, which include the individual's goals or internal standards, may be influential or controlling in nature." The authors further assert that when an individual attempts to regulate him/herself in contradiction with these goals or internal standards, the potential for the maintenance of these behaviors over time is less than ideal. Cognitive evaluation theory may apply to the selection of an exercise activity particularly when an individual attempts to lose weight by running alone on a regular basis. If such an individual were to value high levels of social interaction and team sports over low levels of social interaction and

individual sports, then the likelihood that this individual will maintain the exercise regimen is poor. The person falls victim to the contradiction between his/her internal standards and the characteristics of an activity. Deci and Ryan assert that goals which pressure people into action cause anxiety and tension, and have an adverse effect on intrinsic motivation, whereas goals which lead to feelings of competence and self-determination contribute to the adherence of selected activities.

Motivation to adhere to an exercise regimen can be conceptualized in other ways as well. Maehr and Braskamp (1986) propose the theory of personal development, which is similar to the cognitive evaluation theory in that, a people's investment of their resources in a situation is based on the subjective meaning that the situation holds for the individual. Therefore, the individual who places a substantial amount of importance on being physically fit is more likely to commit him or herself to, and adhere to, an exercise regimen than the person who places little value on fitness. Further, the theory of personal development, "meaning," is composed of three interrelated concepts: personal incentives, sense of self, and perceived options. Personal incentives are the motivational focus of behavior, or the goals. Sense of self is the individual's perception of his or her competence in a given situation and, finally, perceived options are the behavioral alternatives in each situation. According to Duda (1989), an understanding of a person's exercise goals, along with self-perceptions and situational influences, can provide insight into an individual's choice of sport or exercise and his or her persistence with that choice.

Both, Maehr and Braskamp's (1986) theory of personal investment and Deci and Ryan's (1985) cognitive evaluation theory emphasize the importance of a person's reasons for exercising and choice of the exercise or sport activities. When hypothesizing

about reasons for selection and adherence to sport or exercise, enjoyment of the activity must rank near the top. Wankel (1985), reports that surveys consistently show enjoyment to be an essential component of exercise participation, and Perrin (1979) reported that long-term participants rated enjoyment as a primary reason for continued involvement. Additionally, Boothby, Tungatt, and Townsend (1981) reported that lack of enjoyment was an important factor in withdrawal from an activity. These findings seem to support Maehr and Braskamp's work regarding an individual's perception of the activity as being an important determinant in their investment of resources toward the activity.

Beyond motivation and exercise adherence, behavioral scientists have investigated the relationship between exercise and other dimensions of a person's psychology. Davis, Fox, Brewer, and Rattans (1995), citing a lack of research examining the effects of personality variables on exercise participation, designed a study to research the connections between personality variables and exercise participation. Some research has been directed at "high-level" exercisers in this area, with the results indicating that these exercisers tend to be more extraverted than individuals who do not exercise or are "low-level" exercisers (Davis & Fox, 1993). Additionally, Eysenck, Nias, and Cox (1982) have found that team sport participants tend to be more extraverted than individual sport athletes are. Extraverts tend to be socially active and more optimistic and exuberant than their counterparts (Williams, 1992).

To extend the knowledge in this area, Davis et al. (1995), hypothesized that extraverted male and female exercise participants would not endorse mood improvement as a motivator for exercise, and that they would likely endorse the social component of exercise as being a motivating factor. In their study, Davis, et al., administered three

separate measures to their subject pool consisting of 106 male and 105 female "regular exercisers." The measures were the Reasons for Exercise Inventory (REI), the Eysenck Personality Questionnaire (EPQ), and a physical activity participation level interview. The REI measures a person's identification of exercise motivations. The Eysenck Personality Questionnaire measures the dimensions of Extraversion-Introversion, Neuroticism-Stability, and Psychoticism, which an individual possesses.

Results of the study indicated few differences between women and men in the reasons reported for exercising, although women did endorse "mood improvement" more than men did as a reason to exercise. More important results were found when analyzing the correlation between the Eysenck Personality Questionnaire and the Reasons for Exercise Inventory (REI). The personality variable, extraversion, was positively correlated with the weight control, general appearance, and enjoyment factors, while the variable neuroticism, was positively correlated with all of the REI factors except for fitness and health. Neuroticism was most strongly correlated ($P< 0.0001$) with the body-image related scales. Therefore, one might conclude based on the research that those who scored higher on neuroticism scales would have more of a predisposition to suffer from unhealthy exercise practices and or eating disorders.

While there is no lack of research in the broad scope of personality and its relationship with sport and exercise, the bulk of the research has been targeted at the comparison among athletes and nonathletes. Additionally, the idea that the athlete differs personality-wise from the nonathlete has been the focus of contradictory research findings throughout the years (Newcombe & Boyle, 1995). Eysenck, Nias, and Cox (1982) have suggested that these discrepancies in research findings have been the product of a lack of

consistent methodology (e.g., sample size, testing instruments, statistical analysis) among the researchers, and problems in definition and conceptualization of the research.

These problems aside, several studies, across a variety of sports and cultures, have shown consistent results when comparing the personality of the athlete to the nonathlete (Newcombe & Boyle, 1995). Based on his studies with Olympic caliber athletes, Ogilvie (1968), made the assertion, that an athlete's participation and success in his or her sport is due to the personality characteristics of the athlete.

Some of the earliest studies of personality aspects of athletes described the athlete as being more extraverted, less-anxious, and less neurotic than his or her nonathlete counterpart (Cooper, 1969; Warburton & Kane, 1966), and athletes at the university level have been shown to be "less anxious and depressed, and more extraverted and stable than nonathletes." (Williams, 1985). Johnson and Morgan (1981), using longitudinal studies, showed that college athletes from several different sports scored significantly lower on measures of depression, social introversion, and unusual feelings and behaviors.

Eysenck, Nias, and Cox (1982) drew several conclusions about the personality of the athlete, based on Eysenck's three dimensions of personality – extraversion, introversion, and psychoticism. Primarily, they found that athletes tend to be more extraverted than nonathletes. Eysenck, et al., (1982) attribute this to an athlete's higher pain threshold, competitiveness, assertiveness, and speed of reaction. Athletes also are less neurotic than the nonathlete, apparently due to the lower levels of anxiety, which they experience. Finally, the athlete scores higher on psychoticism scales which can be attributed to the aggressive and competitive nature of most sports.

When reviewing the literature regarding the relationship between athletics and personality, Cooper (1969) noted that no IQ differences had been discovered between athletes and non-athletes, but there was a tendency for athletes to be more achievement oriented than nonathletes. His review contained the familiarly noted differences of athletes being more outgoing socially (extraverted), more aggressive, less anxious, more emotionally stable, and having a greater tolerance for pain.

Kirkcaldy (1982), in a study using the Eysenck Personality Questionnaire to compare national-level German athletes to regional level athletes and to nonathletes, found results similar to those of his fellow researchers. Extraversion scores were found to lie above the population norms for both male and female athletes. Males also scored higher on psychoticism measures, while neuroticism scores for both males and females were found to be lower than nonathletes which would be in agreement with earlier research findings using the Eysenck Personality Questionnaire (Eysenck et al., 1982).

Examining the differences between athletes and nonathletes in a different manner, Hartman and Rawson (1992) used Zuckerman's (1964) Sensation Seeking Scale to explore the relationship between sensation seeking and participation in athletics. As will be explained in more detail in Chapter II, Hartman and Rawson found that athletes are higher sensation seekers than nonathletes regardless of gender.

As Eysenck, Nias, and Cox (1982) discussed, there appears to be substantial evidence that the athlete differs personality-wise from the nonathlete. However, research findings have not always been consistent in the results. Methods to correct this have been suggested by Eysenck et al., as well as other researchers in the area. One of the solutions appears to be in taking a micro approach to researching the elements of personality in

sport. Furnam (1990) explains the importance of clearly defining and categorizing what the actual target of the research is when he states, "The reasons why definitions and categorizations is (sic) important is because both personality and sport are multi-faceted and it is quite possible that some dimension of the former are related to some, but by no means all, dimensions of the latter." Specificity, then, is critical when comparing the personality of athletes to nonathletes or to other athletes.

In attempting to provide clearer distinctions in the research, Eysenck, Nias, and Cox (1982) divided sport in two ways: individual versus team sports, and outstanding versus average performance. As will be discussed in Chapter II, the literature has demonstrated that differences in personality do exist along these lines, as well as within the sport types of, individual or team sports. What the literature lacks is research about the personality differences within sports. For example, how do marathon runners differ from other long-distance runners who compete at different distances (e.g., 10k) or on different terrain (cross-country)?

Jerome and Valliant (1983) compared the personalities of marathon runners to cross-country skiers using Cattell's 16 Personality Factor Inventory (16 PF). While these athletes do not participate in the same sport, the requirements, both mentally and physically are very similar in nature; both are individual events, and both are often conducted in unfavorable weather conditions. The conditions for training are also very similar between the two sports, in that the training is often done alone and with a low level of supervision if any at all. Additionally, as Jerome and Valliant illustrate, both sports are considered to be "rhythmical endurance activities with a strong motor, as opposed to perceptual component" (Jerome & Valliant).

Jerome and Valliant (1983) hypothesized that since the research has demonstrated that specific personality traits are conducive to participation in certain sports, individuals who participate in sporting events which are so similar in nature, such as marathon running and cross-country skiing, will share certain personality characteristics. To investigate their hypothesis, the researchers administered the 16PF to 37 male marathon runners and 45 male cross-country skiers (Jerome & Valliant, 1983). The results were compared using a one-way analysis of variance examining the personality dimensions.

The analysis of variance indicated several significant differences (significant level $p \leq .05$) between the groups of athletes (Jerome & Valliant). The marathon runners were more intelligent ($p \leq .006$), tender-minded ($p \leq .022$), subjective ($p \leq .048$), and creative ($p \leq .007$) than the cross-country skiers. Jerome and Valliant contend that these results supported the hypothesis that the athletes would share certain aspects of personality due to the similar nature of selected sports. They report that those traits in which the athletes differ are traits that lie outside the population norms, and the traits that the athletes were similar in, lie outside of the population norms as well. This research lends itself to the idea that while athletes clearly can be differentiated from non-athletes, and even from other athletes in different sports, in regards to personality, athletes may in fact differ personality-wise from other athletes who participate in the same type of sport with different components of endeavor.

Statement of the Problem

While the literature contains several studies examining the differences in personality between the athlete and the non-athlete, and even between athletes of different

sports, there is a significant lack of research examining the differences in personalities between athletes within sports. Little is known as to how the different aspects of a person's personality may affect how he or she chooses position or discipline within a sport.

Recent research (Hartman & Rawson, 1991; Rowland, Franken, & Harris, 1986; Zuckerman, 1979, 1983) has attempted to clarify these inquiries by examining the concept of the sensation seeking personality trait (Zuckerman, 1979) through the use of the Sensation Seeking Scale – Form V (Zuckerman, 1994). This scale provides the researcher with information about an individual's tendencies to seek stimulating situations in life, and specifically, the motivations behind these tendencies. This is addressed on four subscales and one total-score scale. The subscales are; Thrill and Adventure Seeking (TAS) which measures "a desire to engage in risky and adventurous activities and sports providing unusual sensations," Experience Seeking (ES) which provides a measure of the individual's "seeking of stimulation through the mind and the senses, through music, art, travel and even psychedelic drugs," Disinhibition (Dis) which investigates the subject's pursuit of arousal through "drinking, partying, gambling and sexual variety," and Boredom Susceptibility (BS) which demonstrates an individual's "aversion to repetitive experience" (Zuckerman, 1983). The total score is arrived at by summing the subscales.

Kircaldy (1982) proposed the importance of specific categorization of athletes when conducting personality research and suggested that an athlete's personality could predict not only the type of sport the athlete would choose, but the position or discipline within that sport. This suggestion, coupled with the proposal of a sensation seeking

personality trait has important implications for the area of sport psychology. However, little research exists which actually examines the microcosms of sport, the disciplines within a sport. Therefore, a relevant question to this study is: Which, and in what way, do aspects of an individual's personality influence their selection of the form of sport or exercise in which to participate. Measures on the Sensation Seeking Scale – Form V (SSS-V) and the Eysenck Personality Questionnaire - Revised (EPQ-R) will provide data to assess differences between two groups of bicyclists, mountain bikers and road cyclists. A more precise question is: Do mountain bikers and road cyclists differ on levels of sensation seeking or other areas of personality, such as those measured by the Eysenck Personality Questionnaire.

The purpose of this study is to expand on current literature by examining this relationship between the degree of sensation that a person requires, and their participation in particular aspects within a sporting discipline. Specifically, this study will assess the sensation seeking levels of cyclists who participate in either mountain biking or road cycling. These groups of cyclist were chosen because of the similarity between the sports, which allows for an inductive approach to the research. The two sports are very similar in that the act of riding a bike is the basis for the sport. The kinesiology of the two activities are identical. The difference between the two disciplines is the terrain on which the bicycles are ridden. Mountain bikers typically ride their bicycles on unpaved, varying terrain. This can range from gravel paths to wildly undulating trails in the mountains which include obstacles to be negotiated such as, roots, rocks, and streams. Road cyclists on the other hand, typically ride their bicycles on paved surfaces such as asphalt paths in parks, local city streets, and rural highways. The focus of the study, then,

would be to determine whether a difference in personality may account for a person's decision to participate in the off-road (mountain biking) or the on-road (road cycling) discipline of cycling.

An additional component of the study will be a replication of previous studies using the Eysenck Personality Questionnaire to examine the differences between groups of athletes. Results of the study will provide a clearer understanding of why people are drawn to certain areas of a sport and/or exercise over other areas in that sport.

Hypotheses and Research Questions

Null Hypothesis One

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the total measure of sensation seeking, as measured by the SSS-V.

Null Hypothesis Two

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Thrill and Adventure Seeking subscale of the SSS-V.

Null Hypothesis Three

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Experience Seeking subscale of the SSS-V.

Null Hypothesis Four

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Disinhibition subscale of the SSS-V.

Null Hypothesis Five

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Boredom Susceptibility subscale of the SSS-V.

Null Hypothesis Six

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Psychoticism subscale of the EPQ-R.

Null Hypothesis Seven

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Extraversion subscale of the EPQ-R.

Null Hypothesis Eight

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Neuroticism subscale of the EPQ-R.

Null Hypothesis Nine

There will be no significant difference between male and female participants on the total measure of sensation seeking, as measured by the SSS-V.

Null Hypothesis Ten

There will be no significant difference between male and female participants on the Thrill and Adventure Seeking subscale of the SSS-V.

Null Hypothesis Eleven

There will be no significant difference between male and female participants on the Experience Seeking subscale of the SSS-V.

Null Hypothesis Twelve

There will be no significant difference between male and female participants on the Disinhibition subscale of the SSS-V.

Null Hypothesis Thirteen

There will be no significant difference between male and female participants on the Boredom Susceptibility subscale of the SSS-V.

Null Hypothesis Fourteen

There will be no significant difference between male and female participants on the Psychoticism subscale of the EPQ-R.

Null Hypothesis Fifteen

There will be no significant difference between male and female participants on the Extraversion subscale of the EPQ-R.

Null Hypothesis Sixteen

There will be no significant difference between male and female participants on the Neuroticism subscale of the EPQ-R.

Assumptions and Limitations

There are several basic assumptions which underlie this study. The first is that the personality constructs of sensation seeking as described by Zuckerman (1979), and psychoticism, neuroticism, and extraversion as described by Eysenck (1994) are all measurable traits of personality. The second assumption is that mountain bike riding is a sport in which high sensation seekers are drawn to participate. The third assumption is that within the population, from which the subjects are drawn, there will be some subjects that are high sensation seekers. Finally, it is assumed that subjects will provide truthful responses on the assessment.

There are also limitations to this study. The first is that the Sensation Seeking Scale – Form V (Zuckerman, 1994) and the Eysenck Personality Questionnaire - Revised (Eysenck & Eysenck, 1994), are self report measures, and will be the instruments utilized to obtain data about the subjects' personalities. Self-report measures, by their nature, allow the respondent to influence the results by attempting to look better, or worse as the case may be, by manipulating their responses to the questions on the measure.

The second limitation is that the subject pool is limited to individuals recruited from cycling clubs in the Southwest United States. To the extent that these clubs may be unlike other clubs nationwide, the results of this study may not be relevant and applicable to a larger population.

Definitions

Athlete – An individual who participates regularly in a sport, exercise, or activity, which requires physical skills, and the training of these skills to do so.

Boredom Susceptibility – An individual's aversion to repetitive experience.

Disinhibition – An individual's pursuit of arousal through drinking, partying, gambling, and sexual variety.

Elite Athlete – An athlete who has reached at least a national level of competition performance in his/her sport. This includes but is not limited to varsity athletes at the university level.

Experience Seeking – An individual's seeking of stimulation through the mind and the senses, through music, art, travel, and even psychedelic drugs.

Extraversion – The personality description of an individual who is sociable, has many friends, craves excitement, takes chances, is impulsive, and does not like to be alone.

Introversion – The personality description of an individual who is quiet, introspective, fond of individual activities, reserved in his or her demeanor, and has a small group of close friends.

Mountain Biker – An athlete who consistently participates in bicycling on unpaved surfaces and undulating terrain on bicycles equipped for such activities.

Mountain Biker Group – Consists of subjects recruited from bicycle club meetings, who participate in only the mountain biking aspect of bicycling.

Neuroticism – The personality description of an individual who is anxious, worrisome, moody, frequently depressed, and typically has strong emotional reactions to life events.

Nonathlete – An individual who does not participate in a sport, exercise, or activity, which requires physical skills, and the training of these skills to do so.

Psychoticism –

Road Cyclist – An athlete who consistently participates in bicycling on paved surfaces on bicycles equipped for such riding.

Road Cyclist Group – Consists of subjects recruited from bicycle club meetings, who participate in only the road cycling aspect of bicycling.

Sensation Seeking Trait – The trait of personality proposed by Zuckerman (1979) that consists of "the need for varied, novel and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience."

Thrill and Adventure Seeking – An individual's desire to engage in risky and adventurous activities and sports providing unusual sensation.

Significance of the Study

Despite considerable evidence regarding the relationship between personality and sport or exercise participation, and a modicum of literature addressing the issue of sensation seeking in athletes, no research was found that related the idea of sensation seeking to selection of aspects or dimensions within a sport or exercise. Additionally, the majority of the research has examined two comparisons, the athlete to the nonathlete, and the elite athlete to the average competitor. The current study will add to the limited body

of information in the research literature concerning this aspect of the relationship between personality and sport/exercise.

The practical implications of this research are to help inform interested parties within the sport and exercise sciences as to the importance of the relationship of specific aspects of personality to selection of, and adherence to exercise regimens and sport participation. The psychological and physiological health-related benefits of participation in exercise are evident only in those individuals who participate for lengthy periods of time. Exercise scientists often tout lifelong participation as the goal for exercise participants. A clearer understanding of the relationship between an activity and its participants will permit better counseling for novice exercisers regarding their selection of an activity. People are much more likely to sustain exercise participation when they engage in activities that have inherent appeal and complement their achievement motivation.

Further implications for the study can be found in the areas of elite athlete competition. Psychological assessment during the initial stages of training or participation at the national team level will aid national team staff members in their selection process and in their efforts to match athletes in the areas of competition for which they are best suited.

A common concern among coaches of elite athletes at the national and international level is the placement of athletes in the events within their disciplines which they are most likely to experience the most success. Often, a cyclist will attend a development camp at the Olympic Training Center with a focus on one discipline of cycling, and then be diverted into another area of cycling competition based on a coach's

assessment of the athlete's potential for success in that area. Many times, the athlete may not have ever participated in that particular discipline of cycling due to a lack of that particular type of competition (e.g., track cycling) in his or her geographical region.

Research in the area of the effects of personality on sport selection and adherence would aid coaches and administration at the elite levels of sport to begin the process of determining the athlete's potential for success in various disciplines. Furthermore, valuable time testing and retraining the athlete for various disciplines might be saved if psychological assessment can be shown to provide valid feedback regarding the selection process. If an athlete were able to complete these assessments and gain feedback, even prior to attending a training camp or residence program, then the amount of time saved on testing the athlete in different disciplines within a sport could be spent on further developing that athlete in the discipline which has been identified as being his or her strength in competition.

CHAPTER II

REVIEW OF THE LITERATURE

This study will examine the relationship between aspects of an individual's personality and his/her participation in particular sporting events and/or exercise activities. Below is a brief review of the literature regarding the personality aspects of athletes. This is followed by a review of studies which have examined the specific theory of a personality trait of sensation seeking.

Personality Differences Among Athlete Groups

Several researchers have examined the differences in personality factors among athletes in different sports, and between elite and average level competitors within the same sport. Dowd and Innes (1981), cite previous research findings as the basis for their research study, using Cattell's 16 PF to examine the personality differences between elite and lower-level athletes in suggesting that elite level athletes differed from lower-level competitors by having more self-control, greater conscientiousness, and higher intelligence. Other studies suggesting that elite-level athletes are more extraverted (Eysenck, 1982), and thus have higher levels of pain tolerance were also discussed by Dowd and Innes.

For Dowd and Innes, an additional motivation for their study was to clear up discrepancies in the literature. Equivocal results can be seen in many areas when other researchers have attempted to replicate studies. Singer (1969) had found no differences in personality between elite level athletes in tennis and baseball and their respective lower-level counterparts. Keogh's (1959) study also failed to find significant differences when comparing athletes at differing levels of competition.

Dowd and Innes (1981) thoroughly examined the confounds to research of this type and have provided some suggestions for their control. First is possible that the nature of the different sports may require dissimilar personality characteristics in order to gain an elite level mastery of the sport. An example that they provide is that the athlete involved in an individual sport may benefit from being more introverted and self-sufficient, whereas a person who has these personality characteristics may suffer in a team sport situation due to the incongruity of the personality and the need for a more cooperative approach in team sports. Research conducted by Peterson, Weber, and Trousdale (1967), and Booth (1958) supports these assertions, while Malumphy (1968), found the opposite to be true when she found that the individual athletes in her sample where more extraverted than the team sport participants.

Dowd and Innes (1981) approached their study from the position that an athlete's personality traits are catalysts for sport selection and participation. Support for this position is found in studies which lead to the conclusion that "broad-based traits" play significant roles in behavior prediction.

Participants in the Dowd and Innes (1981) study consisted of 47 individual sport (squash) athletes and 46 team sport (volleyball) athletes. The athletes were approached at

their specific venues and were given a personal data questionnaire and the 16 PF to complete and return to the researchers (Dowd & Innes, 1981). Data was analyzed using a discriminant analysis. Analysis was performed separately on the two independent variables; level of competitive performance and type of sport. Results indicated that the elite-level competitors differed from the regional-level athletes in the areas of intelligence and anxiety, with the elite-level athletes being more intelligent and having lower levels of anxiety.

Modest differences were found by comparing athletes from sport to sport, using all sports and inclusive of all levels of athletes. Volleyball players had a tendency to be more forthright, more natural and spontaneous in their relationship with others, and exhibited less anxiety.

Significant results were found between elite-level athletes of different sports, with volleyball players appearing to be more assertive, intelligent, controlled, venturesome, imaginative, stable, reserved, and less anxious (Dowd & Innes, 1981). Results of the research led the authors to conclude that it would be premature to eliminate research examining the relationship between personality and sport participation and or performance, and further research should be conducted to attempt to consolidate research findings into a identifiable trend (Dowd & Innes, 1981).

Kircaldy (1982) furthered the research into personality differences amongst athletes, both in level of ability and type of sport selected for participation. Agreeing with the position put forth by Dowd and Innes (1981) and Eysenck, Nias, and Cox (1982) one year later, Kircaldy emphasized the importance of more specific categorization of athletes and sports when addressing the broad issue of personality assessment in sport. It

should be clear in the research what type of sport; group or individual is being examined. The athlete has more possible dimensions to consider. Athletes do not simply vary along the delineations naturally occurring through sport selection, but also by skill level, positions played, and/or discipline (e.g., 10K or marathon) within a sport.

In his research, Kircaldy assessed 265 male and 134 female athletes, using the German version of the Eysenck Personality Questionnaire (EPQ). Athletes were grouped by the independent variables gender and level of play; international, regional, local, and recreational. Males and females were found to be roughly the same ages (M = 23.75 yr., F = 22.26 yr.), have started participation in sport at the same age (F = 13.04 yr., M = 13.11 yr.), and devoted similar amounts of weekly time to training (M = 6.41 hr., F = 6.13 hr.).

Kircaldy used a Pearson correlation to construct separate intercorrelation matrices between the scales "Psychoticism," "Extraversion, " "Neuroticism," and "Lie-scale" for men and women (Kircaldy, 1982). The Psychoticism factor includes measures of tough-mindedness, hostility, aggressiveness, solitariness, and uncaring and insensitivity. Neuroticism measures emotional instability, lability, anxiety, worrying, and restlessness. Extraversion provides a measure of sociability, impulsiveness, carefreeness, optimism, and casualness. Finally, the Lie-scale provides an indication of willingness to conform and a law-abiding inclination (Kircaldy, 1982).

A univariate statistical analysis of these results indicated that males were significantly higher than females on Psychoticism ($p \leq 0.001$), and males were significantly lower on Neuroticism ($p \leq 0.001$) than females.

When comparing the classes of athletes, male national caliber athletes exhibited a more neurotic profile than the middle-class and lower-class male athletes, while the female national-class athletes were lower on neuroticism scores than either the middle or lower-class athletes (Kircaldy, 1982). Both male and female athletes in the whole sample demonstrate a more emotionally stable profile than that of the nonathletes. This is associated with their high scores against the norm on measures of tough-mindedness, extraversion and stability.

Kircaldy's (1982) study demonstrates the need for awareness of the composition of groups when athlete groups are examined. The inclusion of athletes at different levels of achievement in their sport in a single group may unnecessarily confound the results of the research.

Frazier (1987) also studied the differences of personality dimensions among athletes and between the athlete and the nonathlete. Following the research examining the use of personality trait assessment measures such as the Eysenck Personality Questionnaire to examine the differences between the athlete and nonathletes, and among athletes from different sports, Frazier studied the introversion and extraversion measures of elite and nonelite distance runners.

His research was motivated by a lack of consistency in the research studying introversion-extraversion levels of individual athletes. Some studies have shown that although the individual athlete is more likely to be introverted, elite individual athletes have a tendency to score higher on measures of extraversion (Morgan, O'Conner, Ellikson, and Bradley, 1988), while other research has demonstrated a similarity between elite and nonelite individual athletes (Morgan & Pollack, 1977). Frazier indicates that

this discrepancy may be the result of the methodological problems that Eysenck et al. (1982) discussed.

Another motivation for this research study was the lack of research that considers the variables associated with distance running; gender, ability, and amount of time training, when examining personality traits of these athletes. Frazier's hypothesis was that no differences would be found when examining introversion-extraversion measures between elite and nonelite marathoners, and no differences would be found in the relationship between the amount of time that the athletes spent training and introversion-extraversion measures (Frazier, 1987).

Ninety-eight marathon runners, including 25 women participated in the study. They were categorized as elite if their marathon time was under 2:45 for men and 3:05 for women. Those with times slower than that were considered nonelite runners. Nineteen men and seven women were categorized as elite runners. Frazier used the Eysenck Personality Questionnaire (EPQ) to measure introversion wherein lower scores indicate introversion while higher scores suggest extraversion.

Frazier found that elite women had the highest mean (14.29) and elite men had the lowest (10.74). The sample mean was 11.63, which Frazier reports is close to that of the population norm reported in the EPQ manual (Frazier, 1987). Analyses of variance for the level of gender and performance level were performed, with elite women having significantly higher extraversion scores than others in the sample. Further analyses on age and training variables produced no significant results.

Frazier was able to conclude from his study that the sample of marathoners tested, excluding elite women, did not differ significantly from population norms in introversion-

extraversion measures. It is important to note that the sample of elite women consisted of seven individuals, three of whom scored much higher than their colleagues on the EPQ, effectively skewing that samples results. The remaining four women in the sample scored closer to the population norm, and as a result Frazier, addressing this limitation in his study, was inclined to conclude that marathoners as a whole, do not appear to differ from the population norm on introversion-extraversion measures.

Franken, Hill, and Kierstead (1994) approached the sport-personality connection from a different area of inquiry. Their research examined particular aspects of personality to determine if they could serve as predictors of sport interest and participation. Specifically, they looked at the personality measures of competitiveness, instrumentality, expressivity, and sensation seeking. Franken et al., cite various authors in the discussion of the social implications of sport in North America. These authors promote the theory that those who participate in sport are better prepared for life in society due to the competitive nature of the social system, and the need for cooperation with others to obtain goals. Franken and his colleagues, based on the premise that North Americans are socialized to view sport as "a means of succeeding and winning," hypothesize that a person's level of competitiveness would be related to participation in sports as well as, the actual sport selected.

To examine this, Franken et al., (1994) had 300 psychology undergraduate students (121 males, 179 females) complete Franken's Winning Competitiveness, Mastery and Persistence Scale (WCMP), Spence and Helmerich's Work and Family Orientation Questionnaire (WOFO), Bem's Sex Role Inventory Scale (SRI), Zuckerman's Sensation Seeking Scale (SSS), and a 22 item Sports Interest Questionnaire (SIQ).

Results of the study indicated support for the hypothesis that level of competitiveness would be influential in predicting both sport interest and sport selection. When examining the results of the factor analysis a difference between the constructs Motivation for High Performance (MHP), and Winning (WIN) was discovered. Franken et al. suggest that there is a basic difference in these motivations. The first, labeled process motivation, is the idea that a person in competition gains satisfaction from the increased level of his or her own performance that is the result of the competition. The other motivation is labeled outcome motivation and is focused on the fact that in competition there are winners and losers, and the individual competes in sports to satisfy a need to win or succeed over others (Franken et al., 1994).

Motivation for High Performance was found to be the best predictor of participation in competitive sports in both sexes. MHP was also the best overall predictor in males of their interest in competitive sports. Women reported the most interest in gymnastics and figure skating, which would coincide with their endorsements of Motivation for New Learning (MNL) and Expressivity (Franken et al., 1994).

The differences between males and females in their levels of competitiveness and their sport preferences are not surprising considering the sample used. A weakness of the study, however, is that the MHP scale which proved to be the best predictor of male interest in competitive sports is a short scale, and as the authors noted, should be expanded if it is to be used in future research. Limitations noted, this research study provides more support to the theory that personality plays an elementary role in sport or exercise selection, and suggests that further studies with stronger measures be conducted in this area.

Noting similar weaknesses of earlier research, Geron, Furst, and Rotstein (1986) attempted to solve the problem of sampling which they considered to be the primary problem in researching the relationship between personality and sport. In accord with several suggestions from previous researchers such as Eysenck, Nias, and Cox (1982), and Morgan (1978), Geron et al. applied more specific controls in an attempt to clarify differences found in the research. The authors suggested, and utilized the simultaneous comparisons of athletes from separate sports to nonathletes, and athletes of various sports among each other. Comparing a group of nonathletes to a group of athletes without controlling for socio-cultural and socio-demographic variables could lead to a lack of significant findings. Johnson and Morgan (1981), compared athletes and nonathletes based on the variables, gender, age, and educational level, and found significant differences between selected groups.

Geron et al., (1986), used the Minnesota Multi-phasic Personality Inventory (MMPI) to compare the personality characteristics of groups of athletes from nine different sports to those of nine groups of nonathletes. Each group of athletes was matched to a group of nonathletes based on five variables; gender, age, academic level, ethnicity, and socio-economic status. A total of 273 athletes and 379 nonathletes took part in the study.

Analysis of the scores was performed on 29 scales of the MMPI. The initial comparison indicated that 17 of the 29 scales differentiated between athletes from various sports and their nonathlete counterparts. When comparing just athlete groups, nine scales differentiated among the sport groups. Eight of those nine scales were a part of the previous results comparing athletes with nonathletes. A MANOVA indicated that

personality differences among athlete groups was related to socio-demographic factors. When analyzing the groups of nonathletes, there were no significant results.

MMPI personality profiles of the athletes separated by sport revealed a few significant differences when analyzing the T-scores for the scales, F (emotional disturbance), MF (masculinity/Femininity), Pt (psychastenia), CP (competitor), and Tol (tolerance). Track athletes scored highest on scale F ($p \leq .01$). Swimmers and tennis players were higher in masculinity scores with higher femininity scores being recorded by gymnasts and track athletes (sprinters) ($p \leq .001$). Gymnasts and track athletes also indicated high trait anxiety on scale Pt, with swimmers and soccer players scoring low on this variable ($p \leq .05$). Gymnasts, tennis players, and volleyball players had the higher Cp scores while water polo players and soccer players had lower scores ($p \leq .001$). The four athlete groups, gymnasts, swimmers, volleyball players, and soccer players had the highest scores on the Tol scale, with track athletes, tennis players, and soccer players scoring low on this measure ($p \leq .05$) (Geron et al,1986)

Geron, Furst, and Rotstein were able to draw several conclusions from their research. Their primary conclusion is that the socio-demographic factors of the athletes contributed to the personality differences discussed in the study. Secondly, the authors concluded that type of sport, although it is only one of the factors, is strongly related to personality. Athletes, it was found, differ in fewer personality traits than nonathletes (Geron et al, 1986). Another conclusion was that the interaction between sport and socio-demographic factors had a strong influence on type of sport selected for participation.

Due to the number of the subjects in the study and the level of control of variables, this study appears to offer some supporting evidence in the area of personality

research in athletics. The results of this study appear to support the assumption that personality profiles of athletes vary from sport to sport. This would suggest that while athletes as a homogeneous group do seem to differ from nonathletes, the idea of the athlete as a homogeneous set of personality characteristics is too broad for discussion or research. A result of this suggestion should include an attempt in future research to limit the composition of groups of athletes involved to similar or single sports or exercise programs.

Svebak and Kerr (1989), also examined the connection between personality and sports from a slightly different perspective. The two hypothesized the existence of a connection between "explosive sports" and impulsivity, and "endurance sports" and more goal directed and planning behaviors. The idea was that people who are inclined to act impulsively would not be interested in sports that have repetitive or overly time-consuming requirements, such as long distance running or cycling, and rowing. Conversely, those who live more methodical lifestyles and try to avoid situations in which impulsive decision making may be necessary, will not be drawn to sports that require this type of behavior, such as baseball, soccer, or surfing.

These two types of individuals have been discussed in previous literature as possessing different needs for sensation (Zuckerman, 1983), or as arousal avoidant or arousal seeking (Murgatroyd, Rushton, Apter, & Ray, 1978). An instrument developed by Murgatroyd et al., to measure levels of arousal seeking by assessing lifestyle differences among individuals is the Telic Dominance Scale. Another scale that was developed for the assessment of impulsive behaviors among offenders is the Barratt Impulsiveness

Scale (BIS: Barratt, 1985). Svebak and Kerr (1989) used these two instruments in their research to examine the relationship between impulsivity and sport choice.

A total of three studies were performed using groups of local junior athletes (Study 1), students majoring in physical education at a local university (Study 2), and students majoring in something other than physical education at the same university (Study 3). Results of Study 1 indicated that participants in endurance sports (cross country runners) were significantly more planning oriented than those subjects who participated in "explosive" sports (tennis and hockey players). Svebak and Kerr (1989) note the study as being confounded by a limited sample that did not allow for sufficient sampling across age and gender.

In Study 2, subjects were categorized as participating in either "telic" sports, requiring planning and arousal avoidance, or "paratelic" sports, indicated by arousal seeking and impulsive components. Telic sports were identified as long distance running, and rowing, while paratelic sports were cricket, baseball, touch football, surfing and windsurfing (Svebak & Kerr, 1989). The subjects' BIS results were then compared to each group. As in Study 1, results indicated that those who participated in paratelic sports led less planned lifestyles.

Study 3 was designed to provide a balance to Study 2. Since the subjects in Study 3 were not physical education majors, it was assumed that sports would not play as significant of a role in the subjects' lives as they might in the lives of the subjects in Study 2. In this study, subjects were divided into three groups, those who actually participated in paratelic sports, those who did not participate in any paratelic sports but would like to participate, and those who neither participated or showed any interest in

participating in paratelic sports. Subjects in each group were administered both of the measures. A significant finding of this study was that males who participated in paratelic sports fit the profile of the impulsive lifestyle that was evident in the two previous studies. Those males who indicated that they did not participate in paratelic sports but would like to try matched the profiles of the more planning-oriented participants of telic sports (Svebak & Kerr, 1989)

With the aforementioned limitations of Study 1 taken into consideration, this research provides a persuasive argument that certain personalities are drawn to specific types of sports. The number and variety of the subjects and research applications used in the studies lends further credence to the results presented.

Provided then, that individuals are drawn to sports based on aspects of their personalities, and that one of the determinants of activity choice has been shown to be the level of arousal a sport or exercise provides (Svebak & Kerr, 1989), investigations into how and why people seek or avoid this arousal become relevant.

Sensation Seeking

Marvin Zuckerman is the main proponent of the idea that people seek or avoid arousal based on the concept of the sensation seeking trait. He defines the sensation seeking trait as, "the need for varied, novel and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience" (Zuckerman, 1979). This is based to some degree on Leuba's (1955) theory of optimal stimulation, which states that people vary in their need for arousal. Departure from these optimal levels of arousal leads to behaviors that are directed at returning the individual to

the desired state of arousal. Zuckerman (1983) further asserts that the prediction of sports participation and even performance can only be achieved after first examining the essence of the sport and then comparing that to the personality of the individual in question (Zuckerman, 1983). As in the research conducted by Svebak and Kerr (1989), Zuckerman suggests that the sports that require physical risk and/or include anxiety provoking situations will be most attractive to the individual who is in need of raising his/her arousal level.

Zuckerman, Kolin, Price, and Zoob (1964), designed the Sensation Seeking Scale to assess the levels of sensation seeking that an individual requires. The scale consists of four subfactors; Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (Dis), and Boredom Susceptibility (BS). Zuckerman contends that each subfactor could be a trait in itself, due to the reference of the subfactors to specific activities by some researchers.

According to Zuckerman (1979), individuals who can be considered high sensation seekers have a pronounced tendency to underestimate risk aspects of situations compared to low sensation seekers. Others have described this underestimation of risk, simply as sensation seekers experiencing the world as less threatening or dangerous (Franken, Gibson, & Rowland, 1992). When comparing the link between sensation seeking to psychopathy, Zuckerman (1979) found that sensation seeking is related to impulsivity, extraversion, nonconformism, and weak self-control. Additionally, sensation seekers were found to be less socialized than their lower sensation seeking counterparts.

Hartman and Rawson (1991), contributed to the literature base with their study examining the differences between athletes and nonathletes, as well as between males and

females in regards to sensation seeking. Hartman and Rawson chose to broaden the scope of the comparison by not focusing on groups of participants engaged exclusively in risky sports. Their sample instead, consisted of college students participating in a variety of sports. The sample consisted of 159 full-time college students and was divided into four groups based on gender and participation in athletics. The sports in question were basketball, baseball, volleyball, golf, track and field, and tennis. Fifty-five males and 104 females were divided into athlete and nonathlete categories that consisted of 29 male athletes, 26 male nonathletes, 27 female athletes, and 77 female nonathletes. It was hypothesized that athletes would score higher than nonathletes on the Sensation Seeking Scale, and that men would score higher than women.

Experimental control during testing using the Sensation Seeking Scale was shown to be important in research by Schroth (1990). Schroth found that subjects who entered testing in an aroused state scored significantly higher ($p \leq .05$) than those who had been exposed to neutral stimuli prior to testing. Subjects who had been exposed to low arousal situations prior to testing scored significantly lower ($p \leq .05$) than those tested in the neutral condition. To control for these effects, the researchers tested subjects in a neutral situation (Hartman & Rawson, 1992).

Results were analyzed using a Pearson correlations and a 2 X 2 ANOVA design. Significant differences between males and females were found on all scales regardless of athletic participation. Significant differences were also found between athletes and nonathletes on the E-DIS (Experience Disinhibition), I-DIS (Intentions Disinhibition), and TOTAL scales. Based on these results, Hartman and Rawson were able to support their hypotheses. Males did score higher on the SSS than females, and athletes scored

higher than nonathletes. Hartman and Rawson (1992) concluded then, that athletes are higher sensation seekers than nonathletes regardless of gender, and that males are higher sensation seekers than females regardless of athletic participation. Further research can examine more specific areas of sport/exercise participation or selection using studies such as these for a base from which to draw.

In an effort to provide a more comprehensive review of athletics and their relationship to sensation seeking, Schroth (1995) administered the Sensation Seeking Scale to a group of nonathletes and groups of athletes in four male sports and five female sports.

Male athletes by sports were as follows: lacrosse, 26; rugby, 30; crew, 17; and soccer, 15. Female groups consisted of: soccer, 17; volleyball, 9; softball, 15; tennis, 12; and golf, 11. The team sports that were selected were chosen in an effort to provide norms for sports that had not been established with the SSS. Seventy male and 76 female nonathletes were recruited from university psychology classes and utilized as the control; group.

A two-way ANOVA with athletic condition and gender as grouping factors was conducted for total score and each factor. Athletes had significantly ($p \leq 0.05$) higher SSS scores on TOTAL scores and the TAS, DIS, and BS scales than nonathletes. Males had significantly higher SSS scores on TOTAL scores and the TAS, DIS, and BS scales than females. In addition, male contact sport athletes (rugby and lacrosse) were found to have higher sensation seeking needs than male noncontact sport athletes (crew and soccer: Schroth, 1995). This last finding is questionable in that Schroth's classification of what constitutes a contact sport and a noncontact sport seems arbitrary. Lacrosse and soccer

are very similar sports with many of the same rules regarding player contact, but are in separate groups in this study. Additionally the sample sizes of the athlete groups seemed somewhat small.

Schroth's general conclusions that athletes are higher sensation seekers than nonathletes and that males are higher sensation seekers than females agree with the earlier study by Hartman and Rawson (1992) who arrived at the same conclusions. While both studies were similar in results, they also suffered from the same drawbacks of attempting to draw conclusions based on small sample groups ($n < 50$).

Rowland, Franken, and Harrison (1986) attempted to correct the problem of small sample groups used in research involving sensation seeking, when testing their own hypothesis about sensation seeking. The authors hypothesized that sensation seekers participate in a higher number of sports, with some of these sports being high-risk. This participation in a variety of sports would seem to be related to a sensation seeking person's need for new experiences (Zuckerman, 1979) and his/her high susceptibility to boredom (Schalling, Edman, & Asberg, 1983). The high susceptibility to boredom coupled with the need for new experiences might, according to the authors, cause an individual to sample a more diverse set of sports or activities, some of which may be high-risk.

To examine this, Rowland et al. administered the Sensation Seeking Scale and a survey of participation in sporting activities to 97 male and 104 female university students. The survey listed 72 sporting activities, and subjects were asked to indicate the activities in which they were either currently participating, had participated , or would like to try participating. After collection of the survey, individuals were classified

according to sport as currently active, had been active but quit, and had never tried the sport.

Highest mean SSS scores for males were those who were (a) currently active in 20 sports, (b) had been active in 46 sports in the past, or (c) had never tried in only six sports. For females, mean SSS scores were highest in those who were (a) currently active in 30 sports, (b) had been active in 26 sports in the past, or (c) had never tried 16 sports.

Sensation seeking was then correlated with participation in risky sports to determine if high sensation seekers were more likely to participate in these types of sports. Partial correlations, controlled for age, failed to indicate a clear relationship between sensation seeking and participation in risky sports. Further analysis by dividing subjects in groups of high, medium, or low sensation seekers indicated that sports at all levels of risk were attempted by subjects in all three levels of sensation seeking (Rowland et al, 1986).

When Rowland et al.(1986), correlated the desire to try new activities with each sensation level, high sensation seeking males indicated the largest number of "would like to try" responses for 37 of the 72 activities. Medium sensation seeking males indicated 10 activities, and low sensation seeking males indicated 25 activities. Medium sensation seeking females had the largest group of desired new activities with 37 of the 72 sports, compared to 17 for the high and 18 for the low sensation seeking females.

The analysis of the data provided the authors with some support regarding the hypothesis that high sensation seekers are more likely to engage in risky activities due to their tendency to take part in more activities than individuals who seek lower levels of arousal. The high numbers of sports either currently being participated in or having

participated in sometime in the past for both males and females provides the most support for the authors' hypothesis.

Many studies up to this point indicate that research, which has been conducted using the Sensation Seeking Scale in the areas of high-risk and medium risk sports has been supportive of both Zuckerman's theory and measure. Goma (1991) investigated the connection between personality and involvement in high-risk sports, specifically, mountaineering. Goma relates much of his study to the previous work by Gray (1971) which furthered Eysenck's personality theory by relating the constructs of impulsivity and anxiety to a quadrant of Eysenck's personality dimensions, Intraversion, Extraversion, Neuroticism, and Psychoticism. In relation to risk, the theory proposes that the Neuroticism-Extraversion quadrant is the area of high sensitivity to reward, and the Neuroticism-Intraversion quadrant is the area of high sensitivity to punishment. Those individuals with a high sensitivity to reward or a low sensitivity to punishment are more likely to take risks than individuals who are highly sensitive to punishment rather than reward. This would seem to agree with Zuckerman's (1979) findings indicating that high sensation seekers scored lower on socialization scales than lower sensation seekers.

Goma (1991), studied the relationship between high physical risk activities and sensation seeking by assessing four groups using the Sensation Seeking Scale (SSS), The Eysenck Personality Questionnaire (EPQ), the Impulsiveness Scale (Imp) of the Impulsiveness-Venturesomeness-Empathy Questionnaire (IVE), the Socialization Scale of the California Psychological Inventory (CPI), the Susceptibility to Punishment Scale (SP), and the experimental version of the Susceptibility to Reward Scale (SR). Group one consisted of 27 mountain climbers who had participated in Himalayan expeditions

(above 27,000 ft.); group two was comprised of 72 mountaineering-related (mountain climbers and alpine skiers) sport participants; 221 sportsmen who participated in different risky sports (white-water canoeing, hang gliding, motor cycle racing, etc.) made up group three; and group four's (control) members were 52 subjects who did not participate in any risky sports.

In regards to the SSS, results indicated that the three groups of sportsmen differed significantly ($p \leq .05$) in comparison to the control group, as would be expected based on previous research. Alpinists (group 1) did not differ from mountaineering related athletes (group 2), or the athlete who participated in other sports (group 3) on any of the SSS measures. The relatively small number of subjects in group 1 might explain these results. Interestingly subjects from group 2 scored significantly higher ($p \leq .05$) than those in group 3 on the total SSS scale and the individual scales, Thrill and Adventure Seeking (TAS) and Experience Seeking (ES) (Goma, 1991).

As predicted by Goma (1991), in this study, and by previous research, the individuals who participate in sports or activities that require a personal risk consistently score higher on the Sensation Seeking Scale than individuals who do not participate in such activities.

Breivik (1996) conducted another examination of high risk athletes using alpine climbers. In his study, Breivik compared groups of athletes, using the Cattell's 16PF and the Sensation Seeking Scale. Groups consisted of seven climbers who had been members of the 1985 Norwegian Everest Expedition, 38 elite Norwegian climbers, 43 sport students from the Norwegian University of Sport and Physical Education, and 26 military recruits.

Results from the 16 PF indicated that Everest climbers scored above population norms on ego strength (C+), dominance (E+), bohemian (M+), radicalism (Q1+), self-sufficiency (Q2+) and independence (Factor IV+) and lower than population norms on superego (G-), control (Q3-), ergic tension (Q4-) and anxiety (Factor I-). The Everest expedition members had more extreme scores than the other groups in the study. Breivik (1996) reported that when examining all groups, climbers are more extreme than sport students on the relevant factors, and the Everest expedition members had the most extreme of all scores.

Not surprisingly, members of the Everest expedition also scored higher than all other subject groups on the Sensation Seeking Scale. An ANOVA indicated that the differences on the scales were significant in comparison with students and recruits on all the scales except Disinhibition (Dis). The expedition members' scores were similar to those of the recruits and students on the Dis scale (Breivik, 1996).

Interpreting the results of this research must be done judiciously considering the small size of the Everest expedition group in relative to the other groups assessed in the study. Additionally, Himalayan expeditions require climbers to endure aspects of the sport that are not necessary in other sports. Expedition members may be away from "home" for up to six months and are frequently required to function for extended amounts of time above 27,000 ft.. This area above 27.000 ft. is commonly referred to as "the death zone" due to the damaging effects inflicted on the human body by lack of oxygen at this altitude. Remaining away from home for such extended lengths of time, and the dangers involved in climbing above 27,000 ft., demand that expedition members function as extremely cohesive units. Personality conflicts within the group are not productive.

This fact may skew the results of testing when members of one particular expedition are used a subject group.

Taking this into consideration, Breivik (1996),states that the results of his research provide further confirmation of the concept of sensation seeking and the idea that people who are sensation seekers will participate in sports or activities that incorporate higher risks. According to Breivik this is an indicator that "in order to enter a high risk sport one has to have 'the right stuff', for instance one needs a lot of aggressiveness and drive and little anxiety or worry." Participation in high risk sports, then, involves a process that includes, according to Breivik, a "filtering" of both psychological and physical factors. In other words, first one must be physically able to take part in the activity and secondly, he/she must be psychologically willing to take the risk that is inherent in the activity.

Summary

This review of the literature provides evidence of the existence of differences in personality between athletes of different sports and among athletes within single sports. Differences have been clearly established between the personalities of selected team sport athletes and individual sport athletes, and explosive sport athletes and endurance sport athletes (Svebak & Kerr, 1989). Additional studies focusing on motivation for participation (Franken, Hill, & Kierstead, 1994) have provided further insight into the process of sport selection.

One of the theories that deserves a more thorough investigation is the idea of the sensation seeking personality trait proposed by Zuckerman (1979). Several studies (Goma, 1991; Hartman & Rawson, 1991; Rowland, Franken & Harris, 1986; Schroth,

1995; Zuckerman, 1979, 1984, 1994) have shown the sensation seeking trait to be a major contributor to sport and exercise choice and participation.

These studies have not been without their limitations. Limitations such as sample size and using too many athletes from diverse sports in one group have been noted as deficiencies in the research (Geron, Furst, & Rotstein, 1986).

Methods to correct these drawbacks have been suggested. Control of the composition of subject groups is important due to the fact that athletes of varying levels may possess different personality characteristics (Geron et al., 1986; Kircaldy, 1982 1986). Additional controls of type of athlete and sport examined in a research study are warranted based on research by Geron et al. (1986).

CHAPTER III

METHODS AND PROCEDURES

The purpose of this study was to compare a group of cyclists who participate in mountain bike style riding (MB) with a group of cyclists who participate in road bike style cycling (RB) on measures of sensation seeking, as measured by the Sensation Seeking Scale - Form V, and the personality measures of neuroticism, extraversion, and psychoticism, as measured by the Eysenck Personality Questionnaire - Revised. Comparisons were made using the total score from the SSS - V and the subscales measuring, Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (Dis), and Boredom Susceptibility (BS), and the measures of introversion (*N*), extraversion (*E*), and psychoticism (*P*) from the EPQ-R.

Preliminary Procedures

Participants

Participants were recruited from a variety of cycling clubs in the Oklahoma City, Tulsa, and Dallas-Ft.Worth metro areas. An attempt was made to recruit a sufficient number of both male and female participants to provide analysis according to gender, as previous research has indicated that male and female athletes are not one-in-the-same (Eysenck, Nias, & Cox, 1982) and we have limited opportunities to compare them in

directly comparable activities. Additionally, there is a profound need for information about females regarding sport, activity, and exercise in the literature. It was assumed that ages of the subjects would vary. Because of the limited nature of this population, every effort was made to include a wide range of ethnic and socioeconomic groups in order to more closely represent population percentages.

Instrumentation

Sensation Seeking Scale–Form V

The Sensation Seeking Scale–Form V (SSS-V; Zuckerman, 1994) is a multi-scale measure of the "sensation seeking trait." The concept of this personality trait was first introduced by Zuckerman (1979). The scale presents the subject with 80 paired sentences labeled A or B, and asks the subject to choose the sentence that "better describes your likes or feelings" (Zuckerman, 1994). Results are tabulated according to four subfactor scales, Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (Dis), and Boredom Susceptibility (BS), and to a cumulative score – Total Score.

Zuckerman (1994) reported the internal reliabilities of the Total score and the individual subfactor scores in a sample of 254 males and 693 females. They found that the Total scale and the subfactor scales had good reliability, ranging from .62 to .84. A sample containing 97 males and 122 females was used to determine internal consistencies, and found good results again, with alpha ranging from .56 to .84. With

regard to test-retest reliability, a sample containing 40 males and 65 females being tested over a three week interval, produced results ranging from .70 to .94.

Eysenck Personality Questionnaire–Revised

The Eysenck Personality Questionnaire–Revised (EPQ-R; Eysenck & Eysenck, 1994) is a multi-scale measure of personality. The first version of this scale was the Maudsley Medical Questionnaire (Eysenck, 1952) which was a 40 item measure of the personality factor, neuroticism. The measure has progressed from the original forty item measure of one trait to a one hundred item measure of the factors, neuroticism (*N*), extroversion (*E*), and psychoticism (*P)*(1994). An additional scale, known as LIE (*L*), used to detect the authenticity of the responses is included as well.

Eysenck and Eysenck (1994) reported that EPQ-R was standardized using a sample of 508 males and 873 females. Differences did exist between males and females, and were significant at the .001 level on all factors except *E*. Males scored higher on *P* but lower on *N* and *L*. The internal reliabilities of the three factors and the LIE scale were found to be good, with values ranging from .66 to .86. Test-retest reliability, using 160 subjects, for the three factors and the LIE scale was found to vary from .71 to .92 over a one-month period.

Institutional Review Board Approval

Approval from the Oklahoma State Institutional Review Board was obtained prior to implementation of the study. Approved consent forms were used during data collection. Prior to data analysis, the responses to the SSS-V and EPQ-R were kept in a

locked file cabinet with access limited only to the researcher. Following analysis of the data, all original documents were destroyed.

Operational Procedures

The examiner attended regularly scheduled cycling club meetings and solicited participation of the club members at the meetings. Additionally, the examiner solicited participation at a mountain bike race in the Oklahoma City, Oklahoma area, a road bike race in the Oklahoma City, Oklahoma area, and a bicycle touring event in Wichita Falls, Texas. The Sensation Seeking Scale–Form V and the Eysenck Personality Questionnaire–Revised, were distributed, along with an informed consent document, a demographics questionnaire and a clasp, mailing envelope, to the individuals who agreed to participate in the study. Instructions to the instrument are at the top of the instrument and were read to the subjects at the club meetings prior to data collection. After completion, subjects enclosed the forms in the envelopes and returned them to the researcher. Participants who wished to complete the scale at their convenience were provided with a self-addressed stamped envelope in which to return the scale. Subjects were instructed to keep from including any identifying information on the instrument or the return envelope.

Statistical Analysis

The responses were entered into a computer file suitable for statistical analysis using SPSS 9.0 and the computer facilities at Oklahoma State University. Descriptive statistics were presented for the total group and all relevant subgroups in the study. Each

of the eight dependent variables were analyzed separately using a 2 X 2 analysis of variance with Gender at two levels and Group at two levels (mountain bike group vs. road bike group). All significance tests were conducted at the .05 level of significance.

CHAPTER IV

RESULTS AND DISCUSSION

Results

The purpose of this study was to examine the relationship between aspects of an individual's personality and his/her selection of, and participation in, sporting events and/or exercise activities. Particularly, the study examined this relationship by comparing athletes in various disciplines within the same type of sport (cycling). This study compared a group of cyclists who participate in mountain bike style riding (MB) with a group of cyclists who participate in road bike style cycling (RB) on measures of sensation seeking and personality. The purpose of examining these two groups was to determine whether these two groups of athletes differed in some way along the lines of the dependent variable being measured.

The participants each completed a demographics sheet and two questionnaires, the Sensation Seeking Scale–Form V, and the Eysenck Personality Questionnaire–Revised (EPQ-R). Comparisons were made using the total score from the SSS-V and the subscales measuring, Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (Dis), and Boredom Susceptibility (BS), and the measures of introversion (*N*), extraversion (*E*), and psychoticism (*P*) from the EPQ-R.

Two hundred participants were solicited for participation in the study. Seventy-seven subjects returned both questionnaires, the demographic sheet, and the consent form, all completed in their entirety for a response rate of 38%. Of the seventy-seven participants who returned completed questionnaires, thirty-seven participants (48%) categorized themselves as participating mainly in mountain bike style cycling (MB), and forty participants (52%) categorized themselves as participating in road bike style cycling. The responses to the demographics questionnaire presented in Table I below.

TABLE I

GROUP DEMOGRAPHICS FOR MOUNTAIN BIKE AND ROAD BIKE CYCLISTS

Category	Mountain Bike Cyclists	Road Bike Cyclists
N	37	40
Male	30	32
Female	7	8
15-19 years-old	2	0
20-29 years-old	11	5
30-39 years-old	16	22
40-49 years-old	7	9
50-59 years-old	1	4
African-American	1	1
Asian-American	2	0
Caucasian	30	35
Hispanic	1	2
Native-American	3	2
Other	0	1
Single	17	9
Married	15	28
Divorced	5	3
Avg. Hours Ridden / Week	7	9.5
Avg. Bicycle Cost	$1,575.00	$2,396.00
Compete in Races	29	34
Participate in Tours	20	32
Member of a Cycling Club	19	40
Avg. Number of Years Cycling	6.25	10.65

Statistical analyses of the subject's responses were conducted using SPSS 9.0. Each of the eight dependent variables were analyzed separately using a 2 X 2 analysis of variance with Gender at two levels and Group at two levels (mountain bike group vs. road bike group). The dependent variables were: the total score for the Sensation Seeking Scale–Form V (SSS-V); the subfactor scales on the SSS-V of Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (Dis), Boredom Susceptibility (BS); and the subfactor scales of neuroticism (*N*), extroversion (*E*), and psychoticism (*P*) on the Eysenck Personality Questionnaire–Revised (EPQ-R). Null Hypotheses of the study were that no significant difference would be found for the dependent variables among gender, type of bike, or the interaction effect between gender and type of bike.

SSS-V Total Score

Table II demonstrates mean scores for the SSS-V total score by gender and type of bike. Table III provides 2 X 2 analysis of variance results for the main effects, gender and type of bike, and for the interaction effect between gender and type of bike.

TABLE II

MEAN SENSATION SEEKING TOTAL SCORES (AND STANDARD DEVIATIONS) BY TYPE OF CYCLING (N=77)

	Male	Female
Road Bike	17.6 ± 5.2	19.8 ± 5.9
Mountain Bike	19.5 ± 7.1	20.3 ± 6.6

TABLE III

TESTS OF BETWEEN-SUBJECTS EFFECTS FOR GENDER, TYPE OF BIKE AND THE INTERACTION EFFECT FOR SENSATION SEEKING TOTAL SCORE (N=77)

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Gender	26.00	1	26.00	.67	.41
Typebike	18.90	1	18.90	.49	.49
Gender*Typebike	6.20	1	6.20	.16	.69
Total	51.10	3			

Neither of the two main effects or the interaction effects were found to be significant. Therefore, Null Hypothesis #1 *(There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the total measure of sensation seeking, as measured by the SSS-V)*; and Null Hypothesis #9 (*There will be no significant difference between male and female participants on the total measure of sensation seeking, as measured by the SSS-V*) were accepted.

SSS-V Thrill and Adventure Seeking Subfactor Score

Table IV demonstrates mean scores for the SSS-V Thrill and Adventure subfactor score by gender and type of bike. Table V provides 2 X 2 analysis of variance results for the main effects, gender and type of bike, and for the interaction effect between gender and type of bike.

TABLE IV

MEAN THRILL AND ADVENTURE SEEKING SUBFACTOR SCORES (AND STANDARD DEVIATIONS) BY TYPE OF CYCLING (N=77)

	Male	Female
Road Bike	6.7 ± 2.7	6.3 ± 2.0
Mountain Bike	6.9 ± 2.2	8.4 ± 1.8

TABLE V

TESTS OF BETWEEN-SUBJECTS EFFECTS FOR GENDER, TYPE OF BIKE AND THE INTERACTION EFFECT FOR THRILL AND ADVENTURE SEEKING SUBFACTOR SCORE (N=77)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Gender	3.80	1	3.80	.67	.42
Typebike	16.72	1	16.72	2.92	.09
Gender*Typebike	12.03	1	12.03	2.10	.15
Total	32.55	3			

Neither of the two main effects or the interaction effect were found to be significant. Therefore, Null Hypothesis #2 (*There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Thrill and Adventure Seeking subscale of the SSS-V*); and Null Hypothesis #10 (*There will be no significant difference between male and female participants on the Thrill and Adventure Seeking subscale of the SSS-V*) were accepted.

SSS-V Experience Seeking Subfactor Score

Table VI demonstrates mean scores for the SSS-V Experience Seeking subfactor score by gender and type of bike. Table VII provides 2 X 2 analysis of variance results for the main effects, gender and type of bike, and for the interaction effect between gender and type of bike.

TABLE VI

MEAN EXPERIENCE SEEKING SUBFACTOR SCORES (AND STANDARD DEVIATIONS) BY TYPE OF CYCLING (N=77)

	Male	Female
Road Bike	5.1 ± 1.7	5.5 ± 2.1
Mountain Bike	5.7 ± 2.2	4.6 ± 1.8

TABLE VII

TESTS OF BETWEEN-SUBJECTS EFFECTS FOR GENDER, TYPE OF BIKE, AND THE INTERACTION EFFECT FOR EXPERIENCE SEEKING SUBFACTOR SCORE (N=77)

Source	Type IIISum of Squares	df	Mean Square	F	Sig
Gender	1.56	1	1.56	.40	.53
Typebike	.45	1	.45	.12	.74
Gender*Typebike	6.50	1	6.50	1.67	.20
Total	8.51	3			

Neither of the two main effects or the interaction effect were found to be significant. Therefore, Null Hypothesis #3 (*There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Experience Seeking subscale of the SSS-V*); and Null Hypothesis #11 (*There will be no significant difference between male and female participants on the Experience Seeking subscale of the SSS-V*) were accepted.

SSS-V Disinhibition Subfactor Score

Table VIII demonstrates mean scores for the SSS-V Disinhibition subfactor score by gender and type of bike. Table IX provides 2 X 2 analysis of variance results for the main effects, gender and type of bike, and for the interaction effect between gender and type of bike.

TABLE VIII

MEAN DISINHIBITION SUBFACTOR SCORES (AND STANDARD DEVIATIONS) BY TYPE OF BIKE (N=77)

	Male	Female
Road Bike	3.4 ± 1.9	4.5 ± 2.4
Mountain Bike	4.6 ± 2.8	5.0 ± 3.1

TABLE IX

TESTS OF BETWEEN-SUBJECTS EFFECTS FOR GENDER, TYPE OF BIKE, AND THE INTERACTION EFFECT FOR DISINIBITION SUBFACTOR SCORE (N=77)

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Gender	6.70	1	6.70	1.12	.29
Typebike	9.30	1	9.30	1.56	.22
Gender*Typebike	1.73	1	1.73	.29	.59
Total	17.73	3			

Neither of the two main effects or the interaction effect were found to be significant. Therefore, Null Hypothesis #4 (*There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Disinhibition subscale of the SSS-V*); and Null Hypothesis #12 (*There will be no significant difference between male and female participants on the Disinhibition subscale of the SSS-V*) were accepted.

SSS-V Boredom Susceptibility Subfactor Score

Table X demonstrates mean scores for the SSS-V Boredom Susceptibility subfactor score by gender and type of bike. Table XI provides 2 X 2 analysis of variance results for the main effects, gender and type of bike, and for the interaction effect between gender and type of bike.

TABLE X

MEAN BOREDOM SUSCEPTIBILITY SUBFACTOR SCORES (AND STANDARD DEVIATIONS) BY TYPE OF BIKE (N=77)

	Male	Female
Road Bike	2.4 ± 1.5	3.5 ± 3.1
Mountain Bike	2.4 ± 2.2	2.3 ± 2.0

TABLE XI

TESTS OF BETWEEN-SUBJECTS EFFECTS FOR GENDER, TYPE OF BIKE, AND THE INTERACTION EFFECT FOR BOREDOM SUSCEPTIBILITY SUBFACTOR SCORE (N=77)

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Gender	3.28	1	3.28	.81	.37
Typebike	4.50	1	4.50	1.11	.30
Gender*Typebike	4.38	1	4.38	1.08	.30
Total	12.16	3			

Neither of the two main effects or the interaction effect were found to be significant. Therefore, Null Hypothesis #5 (*There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Boredom Susceptibility subscale of the SSS-V*); and Null Hypothesis #13 (*There will be no significant difference between male and female participants on Boredom Susceptibility subscale of the SSS-V*) were accepted.

EPQ-R Psychoticism Subfactor Score

Table XII demonstrates mean scores for the EPQ-R psychoticism subfactor score by gender and type of bike. Table XIII provides 2 X 2 analysis of variance results for the main effects, gender and type of bike, and for the interaction effect between gender and type of bike.

TABLE XII

MEAN PSYCHOTICISM SUBFACTOR SCORES (AND STANDARD DEVIATIONS) BY TYPE OF BIKE
(N=77)

	Male	Female
Road Bike	7.4 ± 3.9	6.8 ± 2.5
Mountain Bike	7.9 ± 4.0	9.1 ± 4.5

TABLE XIII

TESTS OF BETWEEN-SUBJECTS EFFECTS FOR GENDER, TYPE OF BIKE, AND THE INTERACTION EFFECT FOR PSYCHOTOCISM SUBFACTOR SCORE
(N=77)

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Gender	1.15	1	1.15	.08	.79
Typebike	25.61	1	25.61	1.66	.20
Gender*Typebike	10.50	1	10.50	.68	.41
Total	37.26	3			

Neither of the two main effects or the interaction effect were found to be significant. Therefore, Null Hypothesis #6 (*There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Psychoticism subscale of the EPQ-R*); and Null Hypothesis #14 (*There will be no significant difference between male and female participants on the Psychotocism subscale of the EPQ-R*) were accepted.

EPQ-R Extraversion Subfactor Score

Table XIV demonstrates mean scores for the EPQ-R extraversion subfactor score by gender and type of bike. Table XV provides 2 X 2 analysis of variance results for the main effects, gender and type of bike, and for the interaction effect between gender and type of bike.

TABLE XIV

MEAN EXTRAVERSION SUBFACTOR SCORES (AND STANDARD DEVIATIONS BY TYPE OF BIKE (N=77)

	Male	Female
Road Bike	12.7 ± 5.2	14.0 ± 3.9
Mountain Bike	15.0 ± 5.1	16.9 ± 2.6

TABLE XV

TESTS OF BETWEEN-SUBJECTS EFFECTS FOR GENDER, TYPE OF BIKE, AND THE INTERACTION EFFECT FOR EXTRAVERSION SUBFACTOR SCORE (N=77)

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Gender	31.47	1	31.47	1.33	.25
Typebike	80.33	1	80.33	3.40	.07
Gender*Typebike	.90	1	.90	.04	.85
Total	112.7	3			

Neither of the two main effects or the interaction effect were found to be significant. Therefore, Null Hypothesis #7 (*There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Extraversion subscale of the EPQ-R*); and Null Hypothesis #15 (*There will be no significant difference between male and female participants on the Extraversion subscale of the EPQ-R*) were accepted.

EPQ-R Neuroticism Subfactor Score

Table XVI demonstrates mean scores for the EPQ-R neuroticism subfactor score by gender and type of bike. Table XVII provides 2 X 2 analysis of variance results for the main effects, gender and type of bike, and for the interaction effect between gender and type of bike.

TABLE XVI

MEAN NEUROTICISM SUBFACTOR SCORES (AND STANDARD DEVIATIONS) BY TYPE OF BIKE (N=77)

	Male	Female
Road Bike	8.7 ± 4.4	10.5 ± 5.6
Mountain Bike	11.2 ± 5.2	12.9 ± 4.3

TABLE XVII

TESTS OF BETWEEN-SUBJECTS EFFECTS FOR GENDER, TYPE OF BIKE, AND THE INTERACTION EFFECT FOR NEUROTICISM SUBFACTOR SCORE (N=77)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Gender	36.87	1	36.87	1.57	.21
Typebike	72.25	1	72.25	3.08	.08
Gender*Typebike	.11	1	.11	.00	.95
Total	109.23	3			

Neither of the two main effects or the interaction effect were found to be significant. Therefore, Null Hypothesis #8 (*There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Neuroticism subscale of the EPQ-R*); and Null Hypothesis #16 (*There will be no significant difference between male and female participants on the Neuroticism subscale of the EPQ-R*) were accepted.

Discussion

Given the previous demonstrations in the literature of differences in personality between the athlete and the nonathlete (Eysenck, et al., 1982; Cooper, 1969; Newcombe & Boyle, 1995; Warburton & Kane, 1966) and the studies showing the personality differences between athletes of different types of sports (Dowd & Innes, 1981; Eysenck, Nias, & Cox, 1982; Peterson, Weber, & Trousdale, 1967) the question was raised whether athletes who participated in different disciplines of the same general sport, such as mountain bikers and road cyclists, differed in some way along the lines of personality. As far back as 1982, Kircaldy had stated the need for more specific categorization of athletes when performing this type of research in an effort to provide a more thorough understanding of where the exact differences lie between these groups of athletes, and how specific one can be when attempting to split athletes into groups based on assumptions made about aspects of their personalities.

Dowd and Innes (1981) had postulated that an athlete's personality would help influence the selection of the sport in which he or she elected to participate. They supported this hypothesis with the results, although modest, from a study which indicated that personality differences existed between subjects grouped by individual sport and team sport participation in their study. Further research in this area seemed to provide the opportunity to expand on the limited amount of literature regarding sport selection, while at the same time addressing the subject matter in the more specific categories suggested by Kircaldy (1982). This study grouped athletes in very specific categories in

an effort to eliminate many of the difficulties inherent in the research discussed by Kircaldy.

The Eysenck Personality Questionnaire–Revised (EPQ-R; Eysenck & Eysenck, 1994) has been one of the most popular instruments utilized in this type of research in the recent literature. Because of this, it was chosen for this study to provide consistency with the literature and to use as a frame of reference, rather than relying on the results of one instrument. The other instrument utilized in the study, the Sensation Seeking Scale–V (SSS-V, Zuckerman, 1994) was chosen because of the specificity of the instrument in relation to the overall scope of the study, and because of its recent use in the literature in similar studies. It was felt that using both of these instruments to address the hypothesis that cyclists who participate in mountain biking would differ in personality, especially in the area of sensation seeking needs, from cyclists who participate in road cycling, would provide a solid assessment of this hypothesis and would also contribute to the previous literature, which had utilized these instruments, regarding personality and sport.

The results of the study, when compared to the sixteen null hypotheses, appear to provide a consistent description of the similarities and differences between these groups of athletes who participate within the same general sport. The acceptance of each of the sixteen null hypotheses in the study indicates that a clear distinction, either in the aspects of personality measured by the EPQ-R or the level of sensation needs measured by the SSS-V, between these two groups of athletes cannot be made based on the results of this study. The results would then tend to support the conclusions of Jerome and Valliant (1983) when they determined that individuals who participate in sports which are similar in nature, share certain personality characteristics.

The fact that the athletes showed no significant differences on the broad range of measures including, the Total Score for the SSS-V or individual measures; Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (Dis), and Boredom Susceptibility (BS), or on the subscales of the EPQ-R; Psychotocism, Extraversion, and Neuroticism, seems to indicate that the athletes in these groups are more similar than different regarding personality aspects and levels of sensation seeking needs. While it is strongly emphasized that the number of female subjects in the sample and used for the comparisons made between gender and the interaction effect is simply too small to make any conclusions, it would appear that, in regards to the personality aspects and level of sensation-seeking needs measured by this study, gender also does not play a significant role in delineating any differences between athletes within this sport.

The key to the research which finds differences in the personality of athletes, from one group to another, seems to be the level of specificity in the categorization of the athletes. Both Keogh (1959) and Singer (1969) demonstrated results similar to those of this study when they were unable to find significant differences between groups of athletes within the same sports. Admittedly, their comparison of athletes groups in the same sports, separated by skill level, differs from this study's separation by discipline within the same sport. However, the results of each of these studies seem to indicate that the amount in which personality differences may account for sport selection and participation may only be paired down so far. In other words, while it is clear, and has been demonstrated numerous times previously in the literature, that athletes may differ personality-wise from one another based on the type of sport in which they participate (Booth, 1958; Eysenck, Nias, & Cox, 1982; Peterson, Weber, and Trousdale, 1967), and

from non-athletes in general (Eysenck, Nias, & Cox, 1982; Kircaldy, 1982; Newcombe & Boyle, 1995), you may only use this assumption of difference in the categorization of athletes at a broad level. The useful differences between athlete groups tend to break down and become much more complex when comparing athletes within the same sport or between very similar sports.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study was designed to address the issue of personality factors and sensation seeking needs regarding sport selection and participation, and to expand on the research in this area. Two main questions were examined: 1) the level of influence which sensation seeking needs have on sport selection between two similar sports, and 2) the level of influence that personality factors have on sport selection between two similar sports.

The scientific literature in this area is thorough regarding the personality differences between athletes and nonathletes, and between athletes who participate in different types of sporting events. The literature was found to be lacking in the areas examining the personality differences between athletes who participate in similar sports or in different disciplines within the same sport. This study, then, followed the suggestions of Kircaldy (1982), by addressing this topic from an inductive point of view.

Rather than attempting to draw conclusions about athlete differences based on research examining vastly different types of sport, this study examined athletes who participate in two disciplines of the same sport, mountain biking and road cycling. It was

felt that comparing two very similar groups of athletes and expanding on this research inductively, provides the researcher with the luxury of being able to avoid making generalizations about athlete groups based on research which has very broad areas of focus. Additionally, working in the inductive mode, allows the researcher to identify more specifically, the point at which certain aspects of personality may begin to influence sport selection or participation choices relative to other aspects of the choice making process (e.g., body type, predisposition for success).

Two instruments were selected to provide measures of sensation seeking need and personality aspects which would be used for comparison. The two instruments, the Sensation Seeking Scale - Form V (SSS-V), and the Eysenck Personality Questionnaire - Revised (EPQ-R), were chosen due to the specificity of personality aspects measured by these instruments and to expand on the already significant amount of research in this area utilizing these two instruments. The five measures of the SSS-V used in the study were, the total score for the SSS-V, the Thrill and Adventure Seeking Subscale Score (TAS), the Experience Seeking Subscale Score (ES), the Disinhibition Subscale Score (Dis), and the Boredom Susceptibility Subscale Score (BS). The three scores from the EPQ-R which were used in the study were the Psychoticism Subscale Score (P), the Extraversion Subscale Score (E), and the Neuroticism Subscale Score (N).

The participants in this study were 77 cyclists whose participation had been solicited at various cycling club meetings, bicycle races, and bicycle touring events in Oklahoma and Texas. The SSS- V and the EPQ-R, were distributed, along with an informed consent form, demographics questionnaire, and mailing envelope, to the individuals who agreed to participate in the study. After completion, subjects enclosed the

forms in the envelopes and returned them to the researcher. Participants who wished to complete the scale at their convenience were provided with a self-addressed stamped envelope in which to return the questionnaires. The data consisted of the seven subscale scores of the SSS-V and the EPQ-R and the total score from the SSS-V.

Findings

The following null hypotheses were tested at the .05 level of significance, and the results are indicated in the following section.

Null Hypothesis One

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the total measure of sensation seeking, as measured by the SSS-V.

Results of the study indicated no significant differences between the groups of cyclists when examining the total score for the SSS-V. Therefore, null hypothesis 1 was accepted.

Null Hypothesis Two

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Thrill and Adventure Seeking subscale of the SSS-V.

Results of the study indicated no significant differences between the groups of cyclists when examining the Thrill and Adventure Seeking subscale scores of the SSS-V. Therefore, null hypothesis 2 was accepted.

Null Hypothesis Three

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Experience Seeking subscale of the SSS-V.

Results of the study indicated no significant differences between the groups of cyclists when examining the Experience Seeking subscale scores of the SSS-V. Therefore, null hypothesis 3 was accepted.

Null Hypothesis Four

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Disinhibition subscale of the SSS-V.

Results of the study indicated no significant differences between the groups of cyclists when examining the Disinhibition subscale scores of the SSS-V. Therefore, null hypothesis 4 was accepted.

Null Hypothesis Five

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Boredom Susceptibility subscale of the SSS-V.

Results of the study indicated no significant differences between the groups of cyclists when examining the Boredom Susceptibility subscale scores of the SSS-V. Therefore, null hypothesis 5 was accepted.

Null Hypothesis Six

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Psychoticism subscale of the EPQ-R.

Results of the study indicated no significant differences between the groups of cyclists when examining the Psychotocism subscale scores of the EPQ-R. Therefore, null hypothesis 6 was accepted.

Null Hypothesis Seven

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Extraversion subscale of the EPQ-R.

Results of the study indicated no significant differences between the groups of cyclists when examining the Extraversion subscale scores of the EPQ-R. Therefore, null hypothesis 7 was accepted.

Null Hypothesis Eight

There will be no significant difference among groups of cyclists who participate in mountain bike riding, and groups of cyclists who participate in road cycling on the Neuroticism subscale of the EPQ-R.

Results of the study indicated no significant differences between the groups of cyclists when examining the Neuroticism subscale scores of the EPQ-R. Therefore, null hypothesis 8 was accepted.

Null Hypothesis Nine

There will be no significant difference between male and female participants on the total measure of sensation seeking, as measured by the SSS-V.

Results of the study indicated no significant differences between male and female participants when examining the total measure score of sensation seeking on the SSS-V. Therefore, null hypothesis 9 was accepted.

Null Hypothesis Ten

There will be no significant difference between male and female participants on the Thrill and Adventure Seeking subscale of the SSS-V.

Results of the study indicated no significant differences between male and female participants when examining the Thrill and Adventure Seeking subscale scores of the SSS-V. Therefore, null hypothesis 10 was accepted.

Null Hypothesis Eleven

There will be no significant difference between male and female participants on the Experience Seeking subscale of the SSS-V.

Results of the study indicated no significant differences between male and female participants when examining the Experience Seeking subscale scores of the SSS-V. Therefore, null hypothesis 11 was accepted.

Null Hypothesis Twelve

There will be no significant difference between male and female participants on the Disinhibition subscale of the SSS-V.

Results of the study indicated no significant differences between male and female participants when examining the Disinhibition subscale scores of the SSS-V. Therefore, null hypothesis 12 was accepted.

Null Hypothesis Thirteen

There will be no significant difference between male and female participants on the Boredom Susceptibility subscale of the SSS-V.

Results of the study indicated no significant differences between male and female participants when examining the Boredom Susceptibility subscale scores of the SSS-V. Therefore, null hypothesis 13 was accepted.

Null Hypothesis Fourteen

There will be no significant difference between male and female participants on the Psychoticism subscale of the EPQ-R.

Results of the study indicated no significant differences between male and female participants when examining the Psychoticism subscale scores of the EPQ-R. Therefore, null hypothesis 14 was accepted.

Null Hypothesis Fifteen

There will be no significant difference between male and female participants on the Extraversion subscale of the EPQ-R.

Results of the study indicated no significant differences between male and female participants when examining the Extraversion subscale scores of the EPQ-R. Therefore, null hypothesis 15 was accepted.

Null Hypothesis Sixteen

There will be no significant difference between male and female participants on the Neuroticism subscale of the EPQ-R.

Results of the study indicated no significant differences between male and female participants when examining the Neuroticism subscale scores of the EPQ-R. Therefore, null hypothesis 16 was accepted.

Conclusions

The results of this study, when considered in the context of the previous literature relevant to this topic, lead the researcher to multiple conclusions. Primarily and most generally, it can be concluded that while it has been demonstrated in the scientific literature that athletes may differ in certain aspects of personality from one type of sport to another (Dowd & Innes, 1981; Eysenck, Nias, & Cox, 1982; Peterson, Weber, & Trousdale, 1967), or from nonathletes (Cooper, 1969, Eysenck, et al., 1982; Newcombe & Boyle, 1995; Warburton & Kane, 1966), athletes who participate in very similar sports seem to share in more aspects of personality than they differ. This particular finding supports the previous research in this area by Singer (1969) and Keogh (1959). Singer researched the personality differences between elite level athletes and their lower-skilled counterparts in the sports of tennis and baseball. Keogh also examined the differences between athletes of different skill levels within the same sports. Neither researcher was able to demonstrate significant differences in personality between athletes who participated in the same sports when the athletes were grouped and compared along the lines of skill level.

It would seem then, based on this current study and the previously cited research that persons with particular personality traits are drawn to certain sports or types of sport (i.e., team versus individual, endurance versus explosive strength), however the role that

personality appears to play in sport selection may only account for these broad selections of sport participation. Furthermore, the use of personality assessment to predict sport preference would seem only to be modestly beneficial at the most general levels of sport selection.

Secondly, a more specific conclusion in regards to the sport of cycling itself, is that, based on the results of this study, personality is not a good predictor of what type of cycling in which an individual may choose to participate. When Jerome and Valliant (1983) compared the personalities of marathon runners to cross-country skiers (two similar sports in regards to physical demands), they noted that these athletes shared more in regards to personality aspects than they differed. In addition, these athletes were found to differ from nonathletes in many of the same areas. While the research in regards to this particular aspect of athlete personality research area is limited, the results are consistent in their findings, which suggest that the choice in participation between two very similar sports or between disciplines within the same sport cannot be attributed significantly to aspects of an individual's personality.

Finally, the third conclusion made as a result of this study is that gender does not appear to play a significant role in the selection of road cycling over mountain biking. Based on the results of this study, it would seem that women do not differ significantly from their male counterparts who participate in cycling in the areas of personality or sensation seeking needs examined in this study. Furthermore, when examined by type of cycling, no significant differences were found between genders for sensation seeking needs or personality. It is noted however, that any conclusions drawn along gender lines in this study are done so cautiously. Based on the small sample of women participants it

would be unwise to interpret the conclusions as anything other than indications of what a larger sample size may demonstrate in regard to gender.

The findings of this study suggest some practical implications for both the health care/sports industry and for the future of the scientific research in this area. When addressing sport participation and exercise adherence in particular, the conclusions to this study would suggest to those who have an interest in helping an athlete choose the best discipline on which to focus within their sport of choice, that they must utilize aspects other than personality assessment in their decision making process. This would be most relevant at the pre-elite level of sport participation when coaches and national team selection staff are attempting to help an athlete, already successful in cycling, choose the discipline within cycling in which he or she would be most successful. At this level, it would seem that continued reliance on physiological measures (maximum wattage generation on an ergocycle, reaction speed, eye-hand coordination, lactate threshold measures, and VO2 Max), would serve the coaches and the selection staff better at this time. Psychological aspects such as personality would still be useful when considering how best to interact with the athlete during the selection and coaching process.

Health care professionals and fitness center staff would also benefit from the results of this study in many of the same ways in which the coaches and selection staff would at the more elite level of sport participation. The primary concern for those involved in prescribing exercise for health care and/or fitness reasons, would seem to be the client's adherence to the exercise regimen. Often, the benefits of participation in exercise are only realized after a lengthy time commitment by the individual. With this in mind, it is imperative for the individual prescribing a course of exercise to tailor the type

of exercise to the client in an effort to insure adherence to the exercise program. Enjoyment of the activity and predisposition for success in the activity are obvious considerations in the selection process. Knowledge of the results of previous studies suggesting the personality differences between athletes of different sports, combined with studies such as this which illustrate the limitations of how far personality may be assessed related to sport participation would likely benefit these professionals in their interactions with their clients.

Finally, the results of this research study, when considered in the context of previous research conducted by Keogh (1959), Singer (1969), and Jerome and Valliant (1983), suggest that an inductive method of examining the effects of personality variables may provide a more comprehensive and accurate understanding of the areas in which personality variables affect sport participation choices among individuals. It has been stated several times previously that a significant amount of research exists regarding the differences in personality which are evident between athletes and non athletes, and between athletes who participate in different types of sport. While this research provides a firm foundation for future research in this area, it does not provide a clear distinction as to where these personality differences exist and at what level personality ceases to be a major influence in sport selection and participation. The inductive approach taken by Keogh, Singer, Jerome and Valliant, and this research study, coupled with the increased controls suggested by Kircaldy (1982) seems more likely to provide accurate a more clear understanding of the extent to which personality factors attribute to an individual's choice of and participation in a particular sport or exercise regimen.

Recommendations

This study appears to contribute to the scientific literature in the area of personality and sport selection. While conclusions have been made based on the results of the study, limitations to the study exist.

An initial concern regarding the study is the sample composition, representativeness, and size. The subjects in the study are all from the Southwest United States, and as a result may not be a representative sample of cyclists in general. Additionally the sample consisted mainly of Caucasian subjects, most of whom were male, and was not representative of the United States in regards to ethnic composition. As data are unavailable regarding the demographics of individuals who participate in cycling, it was unclear whether this was a sample which accurately represented those demographics. The relatively small sample size is also a limitation of the study. This is definitely a concern in regards to the female subjects. While gender was considered a main effect in the study, any conclusions based on the responses of the female subjects should only be used to create more research questions rather than generalize to the population.

Another area of limitation of this study is in the instruments utilized by the researcher. Both of the instruments, the Sensation Seeking Scale–Form V and the Eysenck Personality Questionnaire–Revised, are self-report measures. Subject's scores on self-report measures may not reflect their actual behaviors and/or attitudes. Attempts by the subjects to misrepresent themselves in either a more positive or more negative manner could influence the results of the statistical analysis of the data.

Related to the area of self-report is the fact that the subjects were asked to identify themselves as either a mountain biker or a road cyclist. The thought behind this was that a person would select which group he or she identified with most and this selection would be based in some part on that individual's personality and their inclination to enjoy that type of cycling over the other. The limitation to the study when considering this aspect is that many individual's participate in both types of cycling, and while identifying with one type of cycling serves to categorize the subjects, the results are still subject to the limitations related to a self-report instrument. This alone could serve to confound the results of the study, and the conclusions made from this study should be examined with this as a consideration.

Considering the above limitations, it is recommended that future research be continued in this area of inquiry. Such research would benefit from using a larger sample size from a broader geographic subject pool. Attempts to more accurately represent the demographics of the participants in this sport would provide a greater generalizability to the research results, and provide added validity to the conclusions made.

Assuming that similar results would be found were the study to be replicated, it is recommended that further research be conducted in this area from the inductive method. Broadening the scope of the research from subjects in the same sport to subjects in similar sports would be the obvious next step. While Jerome and Valliant (1983) did this to some extent, the research is dated, and the instruments utilized were not the same as those in this study. Providing some consistency, in terms of methodology and

instrumentation, to the research in this area would certainly strengthen the conclusions which can be made when reviewing the available literature in the future.

In summary, this study appears to contribute new information to the body of literature concerning the effects of personality sport and exercise selection and participation. This knowledge could provide direction for individuals such as coaches, fitness center staff, and health care professionals in their work with individuals regarding sport/exercise selection and adherence issues. Finally, this study indicates the need for continued research in this area to gain a more precise understanding of the role that personality factors play in sport selection and participation.

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APPENDIXES

APPENDIX A

INSTITUTIONAL REVIEW BOARD

APPROVAL FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Date:	August 25, 1999	IRB #:	ED-00-156
Proposal Title:	"A COMPARISON OF SENSATION SEEKING MEASURES BETWEEN ROAD CYCLISTS AND MOUNTAIN BIKERS"		
Principal Investigator(s):	Steve Edwards John Romans L. Christopher DuRoy		
Reviewed and Processed as:	Exempt		

Approval Status Recommended by Reviewer(s): Approved

Signature:

Carol Olson, Director of University Research Compliance — August 25, 1999 (Date)

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX B

INFORMED CONSENT FORM

INFORMED CONSENT FORM
OKLAHOMA STATE UNIVERSITY
AGREEMENT TO PARTICIPATE IN RESEARCH PROJECT

This is to certify that I, _____ hereby voluntarily agree to participate in the research project entitled A Comparison of Sensation Seeking Measures Between Road Cyclists and Mountain Bikers. I understand that the person responsible for this project is Dr. Steve Edwards, Department of Applied Health and Educational Psychology, Oklahoma State University. Dr. Edwards can be reached at (405) 744-7476.

The purpose of this study is to compare the sensation seeking needs between groups of road cyclists and mountain bikers. I will be asked to complete a personality test and a test that measures the level of sensation that I prefer to experience. The entire study will take about thirty minutes.

I will simply be completing two pencil and paper tasks and there are no known risks of physical harm associated with my participation. In the unlikely event that I am physically injured, I understand that I will receive no compensation.

I understand that I am free to refuse to participate and to withdraw from the experiment at any time. I also understand that all information identifying me will be kept in a locked file cabinet, in a locked office. Once all data are collected, ID numbers will be assigned and all names will be removed from the data, consequently there will be no way for the experimenters, or anyone else, to personally identify me. Furthermore, all findings will be presented as group averages only. If I have any questions about my rights as a participant or any questions/concerns during or following my participation, I can contact Dr. Edwards at the phone number above. I may also contact Sharon Bacher, IRB Executive Secretary, 203 Whitehurst, Oklahoma State University, Stillwater, OK 74078; telephone (405) 744-5700.

I have read and fully understand the consent form. I sign it freely and voluntarily. A copy has been given to me.

_____ _____
Participant's Signature Date

I certify that I have personally explained all elements of this form to the subject or his/her representative before requesting the subject or his/her representative to sign it.

_____ _____
Investigator Date

APPENDIX C

INSTRUCTION SCRIPT

SCRIPT

You are being asked to participate in a study which is examining the relationship between sensation seeking and athletic participation. You are being asked to be a participant in this study because of your involvement in the sport of cycling. If you choose to participate in the study, you will be asked to complete two pencil and paper tasks. One of the pencil and paper tasks is a personality test, the other pencil and paper task provides an indication of the amount of sensation that a person seeks in their day to day life. Completing both tasks will require approximately thirty minutes of your time.

No personally identifying information will be asked as a part of the study. Your name will not be on any of the test materials and consent forms will be kept in a file separate from the test materials. All of the materials used in the study will be kept in a locked file cabinet during the course of the study, and will be destroyed after the study has been completed. If you have any questions regarding the study, please feel free to ask an examiner prior to or after completing the study.

Thank you for your consideration.

APPENDIX D

DEMOGRAPHICS QUESTIONNAIRE

Thank you for agreeing to participate in this research study. After you have finished this study, please return the materials including this form, the consent form, and both questionnaires in the stamped envelope which is included in the packet. Do not include a name on any of the forms (excluding the consent form), so that your responses may remain confidential.

If you had to choose one, would you consider yourself a road cyclist or a mountain biker? - _____

Age:15-19 ____ 20-29 ____ 30-39 ____ 40-49 ____ 50-59 ____ 60-69 ____ 70-79_____ 80+ _____

Ethnicity: African-American_____ Asian-American_____ Caucasian _____

Hispanic/Latino_____ Native-American_____ Pacific-Islander_____

Other (Specify)_____

Marital Status: Single_____ Married _____ Divorced _____ Widowed_____

Number of Bikes: BMX _____ Cyclocross _____ Fixed Gear/Track_____

Hybrid _____ Mountain Bike _____ Road _____

Recumbent_____ Touring _____

Hours Per Week BMX _____ Cyclocross _____ Fixed Gear/Track_____

Spent Cycling Hybrid _____ Mountain Bike _____ Road _____

by Category Recumbent_____ Touring _____

Cost of Bicycle ridden the most: _____

Do you participate in sanctioned races (USCF, NORBA, etc.)? YES NO

Do you participate in organized tours? YES NO

Are you a member of a local bike club?

How many years have you been riding?

Gender: Male _____ Female _____

APPENDIX E

SENSATION SEEKING SCALE–FORM V

SENSATION SEEKING SCALE–Form V

Directions

Each of the items below contains two choices A and B. Please indicate which of the choices most describes your likes or the way you feel. In some cases you may find items in which both choices describe your likes or feelings. Please choose the one which better describes your likes or feelings. In some cases you may find items that you do not like either choice. In these cases mark the choice you dislike least. Do not leave any items blank. It is important you respond to all items with only one choice, A or B. We are interested only in your likes or feelings, not in how others feel about these things or how one is supposed to feel. There are no right or wrong answers as in other kinds of tests. Be frank and give an honest appraisal of yourself.

1. A. I like "wild" uninhibited parties.
   B. I prefer quiet parties with good conversation.

2. A. There are some movies I enjoy seeing for a second or even third time.
   B. I can't stand watching a movie that I've seen before.

3. A. I often wish I could be a mountain climber.
   B. I can't understand people who risk their necks climbing mountains.

4. A. I dislike all body odors.
   B. I like some of the earthy body smells.

5. A. I get bored seeing the same old faces.
   B. I like the comfortable familiarity of everyday friends.

6. A. I like to explore a strange city or section of town by myself, even if it means getting lost.
   B. I prefer a guide when I am in a place I don't know well.

7. A. I dislike people who do or say things just to shock or upset others.
   B. When you can predict almost everything a person will do and say he or she must be a bore.

8. A. I usually don't enjoy a movie or play where I can predict what will happen in advance.
   B. I don't mind watching a movie or play where I can predict what will happen in advance.

9. A. I have tried marijuana or would like to.
   B. I would never smoke marijuana.

10. A. I would not like to try any drug which might produce strange and dangerous effects on me.
    B. I would like to try some of the drugs that produce hallucinations.

11. A. A sensible person avoids activities that are dangerous.
    B. I sometimes like to do things that are a little frightening.

12. A. I dislike "swingers" (people who are uninhibited and free about sex).
    B. I enjoy the company of real "swingers."

13. A. I find that stimulants make me uncomfortable.
    B. I often like to get high (drinking liquor or smoking marijuana).

14. A. I like to try new foods that I have never tasted before.
    B. I order the dishes with which I am familiar so as to avoid disappointment and unpleasantness.

15. A. I enjoy looking at home movies, videos, or travel slides.
    B. Looking at someone's home movies, videos, or travel slides bores me tremendously.

16. A. I would like to take up the sport of water skiing.
    B. I would not like to take up water skiing.

17. A. I would like to try surfboard riding.
    B. I would not like to try surfboard riding.

18. A. I would like to take off on a trip with no preplanned or definite routes, timetable.
    B. When I go on a trip I like to plan my route and timetable fairly carefully.

19. A. I prefer the "down to earth" kinds of people as friends.
    B. I would like to make friends in some of the "far-out" groups like artists or "punks."

20. A. I would not like to learn to fly an airplane.
    B. I would like to learn to fly an airplane.

21. A. I prefer the surface of the water to the depths.
    B. I would like to go scuba diving.

22. A. I would like to meet some persons who are homosexual (men or women).
    B. I stay away from anyone I suspect of being "gay" or "lesbian."

23. A. I would like to try parachute jumping.
    B. I would never want to try jumping out of a plane, with or without a parachute.

24. A. I prefer friends who are excitingly unpredictable.
    B. I prefer friends who are reliable and predictable.

25. A. I am not interested in experience for its own sake.
    B. I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal.

26. A. The essence of good art is in its clarity, symmetry of form, and harmony of colors.
    B. I often find beauty in the "clashing" colors and irregular forms of modern paintings.

27. A. I enjoy spending time in the familiar surroundings of home.
    B. I get very restless if I have to stay around home for any length of time.

28. A. I like to dive off the high board.
    B. I don't like the feeling I get standing on the high board (or I don't go near it at all).

29. A. I like to date persons who are physically exciting.
    B. I like to date persons who share my values.

30. A. Heavy drinking usually ruins a party because some people get loud and boisterous.
    B. Keeping the drinks full is the key to a good party.

31. A. The worst social sin is to be rude.
    B. The worst social sin is to be a bore.

32. A. A person should have considerable sexual experience before marriage.
    B. It's better if two married persons begin their sexual experience with each other.

33. A. Even if I had the money, I would not care to associate with flighty rich persons in the "jet set."
    B. I could conceive of myself seeking pleasures around the world with the "jet set."

34. A. I like people who are sharp and witty even if they do sometimes insult others.
    B. I dislike people who have their fun at the expense of hurting the feelings of others.

35. A. There is altogether too much portrayal of sex in movies.
    B. I enjoy watching many of the "sexy" scenes in movies.

36. A. I feel best after taking a couple of drinks.
    B. Something is wrong with people who need liquor to feel good.

37. A. People should dress according to some standard of taste, neatness, and style.
    B. People should dress in individual ways even if the effects are sometimes strange.

38. A. Sailing long distances in small sailing crafts is foolhardy.
    B. I would like to sail a long distance in a small but seaworthy sailing craft.

39. A. I have no patience with dull or boring persons.
    B. I find something interesting in almost every person I talk to.

40. A. Skiing down a high mountain slope is a good way to end up on crutches.
    B. I think I would enjoy the sensations of skiing very fast down a high mountain slope.

END OF TEST

APPENDIX F

SCORING KEY FOR SENSATION SEEKING SCALE–V

SCORING KEY

SENSATION SEEKING SCALE–V

	No. items										
TAS	10	3A	11B	16A	17A	20B	21B	23A	28A	38B	40B
ES	10	4B	6A	9A	10B	14A	18A	19B	22A	26B	37B
Dis	10	1A	12B	13B	25B	29A	30B	32A	33B	35B	36A
BS	10	2B	5A	7B	8A	15B	24A	27B	31B	34A	39A
Total*	40	1A	2B	3A	4B	5A	6A	7B	8A	9A	10B
		11B	12B	13B	14A	15B	16A	17A	18A	19B	20B
		21B	22A	23A	24A	25B	26B	27B	28A	29A	30B
		31B	32A	33B	34A	35B	36A	37B	38B	39A	40B

* The Total score may also be obtained by summing the four subscale scores but it may be desirable to also score the 40 items and check with the sum of the subscales.

APPENDIX G

EYSENCK PERSONALITY QUESTIONNAIRE–REVISED

Name Age Sex

Occupation Date

Firm Marital Status

Health Status

Weight Height Code

INSTRUCTIONS

Please answer each question by marking an (S) beside the "YES" or the "NO" following the question. There are no right or wrong answers, and no trick questions. Work quickly and do not think too long about the exact meaning of the question.

Published By EdITS/Educational and Industrial Testing Service
PO. Box 7234, San Diego, California 92167

FOR EVERY QUESTION, ANSWER YES OR NO

1. Do you have many different hobbies?
2. Do you stop to think things over before doing anything?
3. Does your mood often go up and down?
4. Have you ever taken the praise for something you knew someone else had really done?
5. Do you take much notice of what people think?
6. Are you a talkative person?
7. Would being in debt worry you?
8. Do you ever feel 'just miserable' for no reason?
9. Were you ever greedy by helping yourself to more than your share of anything?
10. Are you rather lively?
11. Would it upset you a lot to see a child or an animal suffer?
12. Do you often worry about things you should not have done or said?
13. If you say you will do something, do you always keep your promise no matter how inconvenient it might be?
14. Can you usually let yourself go and enjoy yourself at a lively party?
15. Are you an irritable person?
16. Should people always respect the law?
17. Have you ever blamed someone for doing something you knew was really your fault?
18. Do you enjoy meeting new people?
19. Are good manners very important?
20. Are your feelings easily hurt?
21. Are <u>all</u> your habits good and desirable ones?
22. Do you tend to keep in the background on social occasions?
23. Would you take drugs which may have strange or dangerous effects?
24. Do you often feel "fed-up"?
25. Have you ever taken anything (even a pin or button) that belonged to someone else?

26. Do you like going out a lot?
27. Do you prefer to go your own way rather than act by the rules?
28. Do you enjoy hurting people you love?
29. Are you often troubled about feelings of guilt?
30. Do you sometimes talk about things you know nothing about?
31. Do you prefer reading to meeting people?
32. Do you have enemies who want to harm you?
33. Would you call yourself a nervous person?
34. Do you have many friends?
35. Do you enjoy practical jokes that can sometimes really hurt people?
36. Are you a worrier?
37. As a child did you do as you were told immediately and without grumbling?
38. Would you call yourself happy-go-lucky?
39. Do good manners and cleanliness matter much to you?
40. Have you often gone against your parents' wishes?
41. Do you worry about awful things that might happen?
42. Have you ever broken or lost something belonging to someone else?
43. Do you usually take the initiative in making new friends?
44. Would you call yourself tense or "highly-strung"?
45. Are you mostly quiet when you are with other people?
46. Do you think marriage is old-fashioned and should be done away with?
47. Do you sometimes boast a little?
48. Are you more easy-going about right and wrong than most people?
49. Can you easily get some life into a rather dull party?
50. Do you worry about your health?
51. Have you ever said anything bad or nasty about anyone?
52. Do you enjoy cooperating with others?
53. Do you like telling jokes and funny stories
54. Do most things taste the same to you?
55. As a child were you ever cheeky to your parents?
56. Do you like mixing with people?
57. Does it worry you if you know there are mistakes in your work?
58. Do you suffer from sleeplessness?
59. Do you always wash before a meal?
60. Do you nearly always have a "ready answer" when people talk to you?
61. Have you often felt listless and tired for no reason?
62. Have you ever cheated at a game?
63. Do you like doing things in which you have to act quickly?
64. Is (or was) your mother a good woman?
65. Do you often make decisions on the spur of the moment?
66. Do you often feel life is very dull?
67. Have you ever taken advantage of someone?
68. Do you often take on more activities than you have time for?
69. Do you worry a lot about your looks?
70. Do you think people spend too much time safeguarding their future with savings and insurance?
71. Have you ever wished that you were dead?
72. Would you dodge paying taxes if you were sure you could never be found out?
73. Can you get a party going?
74. Do you try not to be rude to people?

75. Do you worry too long after an embarrassing experience?
76. Do you generally "look before you leap"?
77. Have you ever insisted on having your own way?
78. Do you suffer from "nerves"?
79. Do you often feel lonely?
80. Can you on the whole trust people to tell the truth?
81. Do you always practice what you preach?
82. Are you easily hurt when people find fault with you or the work you do?
83. Is it better to follow society's rules than go your own way?
84. Have you ever been late for an appointment or work?
85. Do you like plenty of bustle and excitement around you?
86. Would you like other people to be afraid of you?
87. Are you sometimes bubbling over with energy and sometimes very sluggish?
88. Do you sometimes put off until tomorrow what you ought to do today?
89. Do other people think of you as being very lively?
90. Do people tell you a lot of lies?
91. Do you believe one has special duties to one's family?
92. Are you touchy about some things?
93. Are you always willing to admit it when you have made a mistake?
94. When your temper rises, do you find it difficult to control?
95. Do you lock up your house carefully at night?
96. Do you believe insurance schemes are a good idea?
97. Do people who drive carefully annoy you?
98. When you catch a train, do you often arrive at the last minute?
99. Do your friendships break up easily without it being your fault?
100. Do you sometimes like teasing animals?

VITA

Lawrence Christopher DuRoy

Candidate for the Degree of

Doctor of Philosophy

Thesis: A COMPARISON OF SENSATION SEEKING AND PERSONALITY MEASURES BETWEEN ROAD CYCLISTS AND MOUNTAIN BIKERS

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