PROGEN, JANICE LEE

AN EXPLORATION OF THE FLOW EXPERIENCE AMONG SELECTED COLLEGIATE ATHLETES

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AN EXPLORATION OF THE FLOW EXPERIENCE AMONG SELECTED COLLEGIATE ATHLETES

by

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The purpose of this study is to explore Csikszentmihalyi's flow theory in sport as perceived by collegiate athletes. The Sport Flow Q Sort developed by Progen and revised to more comprehensively represent flow theory constructs generates the data. The Q sort contains 80 items and employs a forced format for arranging the items in a normal distribution. Responses of 358 men and women collegiate athletes, collected in the 1980 spring and fall semesters, include members of 39 intercollegiate teams from 22 institutions of higher education. Respondents participate in eleven sports: baseball, basketball, field hockey, football, golf, gymnastics, lacrosse, softball, tennis, track, and volleyball.

Findings indicate that flow is overwhelmingly perceived to be most descriptive of the athletes' sport experiences. Worry-anxiety$_w$ is moderately associated with intercollegiate athletics; feelings of boredom-anxiety$_b$ are not characteristic of their experiences. To alleviate worry, athletes indicate that they seek skill development to meet challenges rather than participate in easier tasks or quit. Structuring the environment to create more challenges is more common than quitting to avoid boredom. The

findings are consistent among all athletes regardless of sport affiliation and gender.

Each of the six flow elements is more self-descriptive of the athletes than feelings of worry or boredom. The order in which the flow qualities are perceived to be like the respondents is: (a) centering of attention, (b) control, (c) merging of action and awareness, (d) autotelic nature, (e) clarity, and (f) loss of ego. Centering of attention and control are consistently reported to be most like the athletes. Clarity and loss of ego are the elements least like the subjective experiences perceived by the sportspersons.

Significant relationships among the flow experiential states substantiate Csikszentmihalyi's theoretical propositions. Moderate negative Kendall tau correlation coefficients are obtained between flow and the other experiential states and between worry and boredom categories. Within worry and boredom feeling state categories generate positive Kendall tau values. Some positive relationships are found among flow elements. A high degree of interdependence among the flow qualities as suggested by Csikszentmihalyi is not evidenced.

Test-retest data from a subsample of 40 athletes reflect consistency in sort responses. The Sport Flow Q Sort is interpreted as reliable particularly when one acknowledges the fluctuating nature of feeling states and the complexity of flow theory ideas and Q technique.

Varimax rotation of data does not simplify or reconstitute the 80 Q statements. However, six factors explaining the highest portion of total variance, 27.8%, contain items which represent broad flow theory experiential states. The factor analysis confirms Csikszentmihalyi's feeling states as measured by the Sport Flow Sort but not the anxiety extremes of worry and boredom and the flow elements. Translating the highly subjective constructs of flow theory to quantitative values may limit the usefulness of factor analysis.

No gender differences are obtained in the athletes' perceptions of the flow experiential states and elements. It is concluded that men and women experience flow, worry-anxiety$_W$, and boredom-anxiety$_D$ similarly in sport.

Some differences exist in athletes' Q-sort responses when sport affiliation is considered. Significant one-way ANOVAs are obtained for each of the flow experiential states and elements for the total sample, women athletes, and/or men athletes. In general, it appears that athletes' experiences in intercollegiate sports are more similar than different.

The findings of this investigation confirm Csikszentmihalyi's flow model as descriptive of intercollegiate athletes' sport experiences. Empirical evidence also supports the reliability of the Sport Flow Q Sort. General similarities in collegiate athletes' Q responses compared to those of high-risk sportspersons and

professional women golfers suggest the generalizability of Csikszentmihalyi's theoretical framework in sport.

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

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CHAPTER I

INTRODUCTION

What does it feel like to participate in sport? How often is an athlete encouraged to discuss such feelings? Questions that begin with the words, "how does it feel," are not usually posed to discover anything of substance related to the joy and satisfaction realized in the process of performing sport skills. Rather, inquiries are made to assess the consequences of successful competition, usually in the immediate excitement of a victory which disallows anything but a superficial response to the questions: how does it feel . . . to be number one, to win a conference championship, to establish a record, to be designated most valuable player?

Athletes are not expected to reflect upon anything other than obvious external goals. Rarely are subjective dimensions of sport anticipated or explored. Allen and Fahey (1977) suggest the significance of awakening athletes to alternatives of knowing sport other than by athletic proficiency.

> Human potential is our greatest untapped resource. It is imperative that persons concerned with the development of human potential, such as those in physical education, sport, and dance, direct their efforts toward finding new ways of facilitating experiences of creativity, freedom, and humanity in physical activity. (p. 3)

Csikszentmihalyi (1974, 1975b) proposes a theoretical framework for studying intrinsically rewarding experiences which may open athletes to new awarenesses in sport. Subjective experiences are emphasized to understand the dynamics of enjoyment. Playful patterns of behavior in various forms provide the underlying foundations for the constructs. Thus, flow theory is deemed a potentially valuable model for studying motivation in sport.

Csikszentmihalyi (1975b) expresses a concern for the pragmatic attitude that pervades most human endeavors, including sport. The trend begins early at the expense of intense enjoyment and personal growth.

> Little-league baseball and piano lessons are organized not to give a child confidence in his or her skills but to show off these skills to an audience. Because of our general ignorance about enjoyment, we do not spend nearly enough time making sure that children meet opportunities for action which will sustain their growth. (p. 200)

Although external rewards are efficient and quantitative criteria to evaluate performance are useful, their obviousness often obscures the goals and feelings that arise out of direct involvement in an ongoing activity. The problem of perceiving external, conventional rewards as exclusive is in denying the existence of intrinsic rewards and experiences that may be central to behaviors, if not the very essence of the activity.

Csikszentmihalyi (1975b) notes that enjoyment is a vague concept that can be safely disregarded in assessing

the human condition. Production, rationalization, and behavior are considered sufficient explanations and objectives. Purposes in sport parallel these general goals as the intrinsic value of participation becomes secondary to winning, justifying programs as a means to other ends such as providing entertainment to a generous alumni, and enforcing team rules to socialize athletes into the fabric of American life. Enjoyment is reduced to the notion of leisure.

> Leisure, . . . that measure of collective well-being, . . . reflects patterns of consumption and has nothing to do with personal satisfaction. The number of outboard motors or snowmobiles owned, the quantity of tennis players or theatergoers, does not tell us anything about whether people enjoy their lives. (p. 197)

Lepper and Greene (1978) and Deci (1975, 1978a) concur with Csikszentmihalyi's position that the prevalent means-ends attitude has potential unintended consequences detrimental to a person's psychological well-being. They suggest that "hidden costs" associated with indiscriminant use of tangible rewards direct an individual's attention to instrumentally relevant parameters with no reference to states of enjoyment. Thus, the personal experiences of being intrinsically motivated often have no place in schools, homes, industry, and social organizations.

> Schools are generally said to be good if students do well on achievement tests; no mention is made of whether they enjoy the learning or experience themselves as competent, self-determining, or excited by schools. (Deci, 1978a, p. 196)

Performance criteria are used almost exclusively to define and evaluate sport, even to the point of obsession with athletic records and statistics. The quantitative, product-oriented approach extends to and dominates sport research. Analysis of the efficient execution of motor skills and the study of factors that contribute to proficient performance and influence active participation represent a substantial amount of the sport research literature.

The athlete's subjective experience and the elusive qualitative dimension of the "lived moment" in sport participation are relatively infrequently addressed (Fetters, 1978; Kleinman, 1972; Park, 1973; Ravizza, 1977; Thomas, 1972). The salience of the total sport experience is not recognized as an end in itself.

> There seems to be considerable evidence that people are well-informed that sports can benefit them physically, even perhaps socially and emotionally. What seems to be lacking, or in short supply, are suggestions that the sporting experience can provide opportunities for catching glimpses of the unity and wholeness of life, for experiencing community with others and an expanded awareness of our own inner capacities. All too seldom are we informed . . . that the purpose of sport may be found in sport itself.

A limited number of studies focus on specific aspects of the athlete's subjective experiences. The "perfect moment" is the topic of Thomas' (1972) philosophic study of the aesthetic perspective of the sport experience. Maslow's concept of the peak experience is employed by

Ravizza (1973, 1977) to investigate the "greatest moment" in sport. Martens' (1978) philosophic inquiry of the sport peak experience, S/*, provides a descriptive synthesis of ideas related to peak experiences, perfect moments, flow experiences, and greatest moments, and applies them to sport. The potential of Buber's I-Thou encounter occurring in the professional sport context is researched by DeSensi (1980).

The above studies are representative of the efforts undertaken to explore subjective interpretations of the sport experience. They present insights into the personal significance attributed to active sport involvement. However, the research addresses relatively exclusive phenomena, i.e., greatest moments and peak experiences. Ravizza and DeSensi directly obtain athletes' perspectives of their sport experiences through interview techniques. But the philosophic studies rely on already existing recorded commentary of sportspersons as data for interpretation.

The importance of Csikszentmihalyi's flow theory for studying intrinsically rewarding experiences in sport is the suggestion that enjoyment and personal satisfaction are available to all persons from beginner to high caliber athlete. By learning how to match one's skills with challenges in the sport environment, intrinsic rewards from simple pleasures to intense feelings of total unity,

personal autonomy, and elation analogous to peak experiences are possible.

Statement of the Problem

The purpose of this study is to explore the constructs of Csikszentmihalyi's (1974, 1975b) flow theory as they may be related to collegiate sport. A revised form of the Sport Flow Q Sort developed by Progen (1978) to investigate stimulus seeking in high-risk sports provides the method for generating data. The research is evolved from the findings of the preceding study. It is an attempt to refine the Sport Flow Q Sort and expand knowledge regarding the flow experiences in sport by assessing its generalizability to more structured competitive sports. A factor analytic strategy is the technique used for determining the instrument's validity in measuring the flow theory propositions.

More specifically, answers to the following questions are sought through the conduct of this investigation:

1. How are the experiential states of flow, worry-anxiety$_{worry}$, and boredom-anxiety$_{boredom}$ described by collegiate athletes? What are the relationships among the experiential states?

2. How are the component elements of the flow experiential states described by collegiate athletes: (a) merging of action and awareness, (b) centering of attention, (c) loss of ego, (d) control of action and the

environment, (e) noncontradictory demands for action with clear, unambiguous feedback, and (f) autotelic nature? What are the relationships among the flow elements?

3. What is the reliability of the Sport Flow Q Sort?

4. Does a factor analysis of the Sport Flow Q Sort suggest new states and elements of the flow experience? How do the resulting factors compare to Csikszentmihalyi's description of the flow theory constructs?

5. Are any gender differences or similarities discernible in men and women athletes' interpretations of the flow experiential states and elements?

6. Do collegiate athletes who compete in different sports perceive Csikszentmihalyi's flow constructs similarly?

Definitions

The following terms are defined for interpretive purposes in the study:

Anxiety$_{boredom}$. An experiential state that results when an individual perceives his or her skills to be greatly superior to the challenges of a situation.

Anxiety$_{worry}$. An experiential state that results when an individual perceives his or her skills to be greatly inferior to the challenges of a situation.

Boredom. An experiential state that results when an individual perceives his or her skills to be more than adequate for meeting the challenges of a situation.

Collegiate sport. Structured athletic experiences for men and women college students administered within institutions of higher education and involving a highly organized schedule of competitions among teams representing different institutions.

Flow. A dynamic feeling state denoting the holistic sensation a person experiences with total enjoyment. Flow is achieved through an individual's perception of congruity between his or her skills and the challenges of an activity.

Flow elements. Qualities of an activity that enhance a person's potential to experience the flow feeling state. These conditions include: (a) merging of action and awareness, (b) centering of attention, (c) loss of ego, (d) control of action and the environment, (e) noncontradictory demands for action with clear, unambiguous feedback, and (f) autotelic nature.

Q sort. The procedure of systematically sorting a number of self-referent statements along a continuum of self-description that ranges from "most like me" to "least like me" with various degrees of agreement between the extremes.

Worry. An experiential state that results when an individual perceives his or her skills to be inadequate for meeting the challenges of a situation.

Assumptions

The following assumptions are acknowledged to underlie the investigation, and as untested propositions, are not investigated as part of the inquiry:

1. The concepts inherent in Csikszentmihalyi's flow theory have sufficient semantic integrity to be evaluated by collegiate athletes with regard to their sport experiences.

2. Facts pertaining to an individual's flow experiences in sport can be measured by the ordering of self-referent statements.

3. The large number of choices representing the trait universe in Q make it possible for an individual to have a unique sort that can be objectively analyzed with exactness (Kerlinger, 1956, p. 289).

4. The validity of the structure of Q statements is an empirical matter (Kerlinger, 1973, p. 590).

5. Factor analysis is an appropriate statistical method for the ordinal data generated by Q provided "the distortions introduced by assigning numeric values to ordinal categories are believed not very substantial" (Kim & Mueller, 1978b, p. 74). In other words, the numbers assigned to the rankings of the statements in Q reflect true underlying metric distances, and possible subsequent

distortions in correlations due to distortions in scaling, are not substantial.

6. Factor analysis can provide self-validating information, and "exploratory factor analysis can provide some empirical confirmation about the appropriateness and economy of the model" (Kim & Mueller, 1978b, p. 49)

Scope

The investigation is limited to the Q responses of 358 collegiate athletes. Both men and women sportspersons comprise the sample of volunteers. Commitment to the sport and depth of experience beyond the beginner level for entry into the study is established by team membership in a competitive intercollegiate sport during the 1979-1980 academic year or the 1980 fall semester. The diversity of activities existing in intercollegiate programs is represented by the athletes' participation in the following sports: baseball, basketball, football, golf, gymnastics, lacrosse, softball, tennis, track, volleyball, and field hockey.

To the extent possible, an equal number of men and women athletes affiliated with the same sport, i.e., tennis, or parallel sports, i.e., softball and baseball, are included in the study. Variations that exist in intercollegiate sports such as team win-loss records and AIAW, NAIA, and NCAA competitive divisions, and athletes' levels of performance as well as range and depth of

experience are reflected in the sample. No effort is made to systematically incorporate these factors into the study for purposes of analysis.

Significance of the Study

The potential significance of the study is perceived from three perspectives. First, the relevance and possible contributions derived by applying theoretical propositions of the flow model to sport are reviewed. Second, the value of sustained research as opposed to one-shot inquiries is considered. Finally, the importance of the Sport Flow Q Sort as an instrument specific to sport for describing dimensions of athletes' behaviors is discussed.

Flow theory provides a conceptual framework for studying intrinsically rewarding experiences. By utilizing Csikszentmihalyi's (1975b) theory to explore athletes' perceptions of enjoyment in their sport experiences, insights may be gained which contribute to understanding the phenomenon of motivation in sport.

Csikszentmihalyi recognizes that studies about the flow state are not the experience itself nor can they provide prescriptions that guarantee persons will achieve the enjoyable sensations of flow. Paradoxically, systematic analysis which defines, measures, and categorizes enjoyment reduces the subjective feeling to an objective entity. Investigating the phenomenon of enjoyment outside the experience of enjoyment is considered a necessary process

by which understanding of intrinsically motivated behavior may be obtained, and then facilitated in everyday life:

> . . . it is important to find out piecemeal and experimentally what combinations of challenges and skills can be accommodated in a classroom, a neighborhood, or a home, so that it can maximize flow involvement in as many people as possible. (Csikszentmihalyi, 1975b, p. 203)

Csikszentmihalyi (1975b, 1978b) contends that the great contribution of intrinsic rewards is their infinite availability from innumerable sources. Such rewards tend to emerge out of direct involvement in the process of doing the activity rather than from accomplishing goals external to or products of the endeavor. Intrinsic rewards tend to be closer to the actual behavior. Further, the conventional rewards that characterize athletic participation such as trophies, scholarships, press coverage, championship status, and so forth, are finite, and therefore limited in their availability.

By understanding the subjective feelings of fun, enjoyment, and fulfillment associated with intrinsic rewards, educators, coaches, and other sport and recreation personnel may be able to structure sport environments that invite entry and encourage sustained participation. Constantly adjusting challenges to match participants' skills is proposed as a central requirement. Perhaps the most significant contribution of flow theory in the sport setting will be to help individuals acquire the skills necessary

to create their own opportunities for enjoyment. When persons are flexible enough to employ their own criteria to restructure surroundings and sets of challenges in relation to their own ever-changing skills, they can be responsible for defining their own rewards and increase their satisfaction in sport beyond the expectations of traditional objective goals.

Csikszentmihalyi describes individuals who develop the skills of creating their own opportunities for flow, and outlines the benefits of intrinsic rewards compared to external incentives. These observations are specifically applicable to sport and relevant to life in general.

> A person who has reached the point of being able to resonate his own abilities with the surroundings, whatever they are, is in harmony with the world. . . . A person who learns to flow with confidence wherever he or she is becomes both truly autonomous and truly connected with the world. Extrinsic rewards will be less needed to motivate him to put up with the hardships of existence. A constant ability to "design or discover something new," "to explore a strange place"--will be enough to motivate action. (Csikszentmihalyi, 1975b, p. 206)

Arlin (1977) observes that one-shot studies typify educational research. Although this practice contributes to the quantity of available literature, it does not necessarily reflect quality in the body of educational knowledge. In his opinion, sustained, cumulative inquiries tend to be more demanding and scholarly, and they contribute more readily to theory refinement and development.

This study is designed to expand upon the findings of an initial investigation of flow theory in sport. Depth of understanding and clarification of the relationships among the flow experiential states and elements in the sport experience may result by application of the theoretical concepts to a broader range of sport activities, i.e., competitive intercollegiate athletics. Further, the empirical evidence generated in the inquiry may provide information relevant to the theory in general, substantiating and/or redefining Csikszentmihalyi's propositions. Instrument development is another valuable possibility of the sustained-type research advocated by Arlin. Refinement of the Sport Flow Q Sort and its administration to other sportspersons may yield pertinent statistical information regarding the validity, reliability, and generalizability of the instrument.

Research tools developed to explore situationally specific behavior and perceptions of individuals in sport are lacking. Inventories developed to ascertain more global aspects of personality and motivation have typically been employed to study psychological aspects of athletes and may be too general to adequately capture subtle and significant aspects of their experiences (Berlin, 1973; Harris, 1975; Kroll, 1976; R. Martens,1976). Therefore, the development of the Sport Flow Q Sort, which is directly related to the sport experience, may be

valuable in filling this void. It may potentially provide a relevant and fruitful research tool for understanding behavior in sport.

CHAPTER II

REVIEW OF LITERATURE

Literature is reviewed to identify the status of knowledge related to underlying theoretical considerations of the flow model and the instrumentation used in the conduct of the inquiry. Flow theory is discussed under the following categories: (a) origins, (b) theoretical constructs, and (c) related studies in sport. Literature contributing to the origins of Csikszentmihalyi's model of enjoyment is organized into three broad categories: self-actualization and peak experiences, intrinsic motivation, and play. The nature, purposes, and methodologies of Q technique are presented to establish the rationale for the development of the Sport Flow Q Sort.

Flow Theory

Flow Theory Origins

Three sources of psychological literature contribute to Csikszentmihalyi's exploration into the nature of enjoyment. Flow theory is derived from a combination of the following ideas: (a) writings on self-actualization and peak experiences by Maslow (1968, 1970) and Laski's (1962) study of ecstatic experiences; (b) research on intrinsic motivation by such well-known psychologists as

White (1959), Berlyne (1960), De Charms (1968), and Deci (1975); and (c) literature about play by scholars such as Huizinga (1955), Callois (1979), and Ellis (1973).

Self-actualization and peak experiences. Recognition of the holistic nature of human behavior and the legitimacy of experiential data in explaining motivation are fundamental to Maslow's humanistic psychology. They are accepted by Csikszentmihalyi and are basic to his study of enjoyment.

Maslow (1970) recognizes that human behavior is a complex and flexible phenomenon with numerous determinants which are not adequately explained by classical psychological approaches. Since "the profoundly holistic human nature [is] in contradiction to the analytic--dissecting--atomistic--Newtonian approach of the behaviorisms and of Freudian psychoanalyses" (p. ix), self-actualization and peak experiences are proposed as additional conceptualizations. Csikszentmihalyi (1975b) offers the flow framework to complement, not substitute for, existing reductionist theories which give reasonably consistent but limited interpretations of human behavior. Considering any psychological model as an exclusive "nothing-but" rather than an "as-if" or potential explanation of behavior is not the intent of Csikszentmihalyi. In fact he cautions against such a point of view.

The focus of Maslow's psychological investigations is on the inner events experienced by individuals. Csikszentmihalyi values experiential data and suggests that subjective perspectives of experience such as those obtained by the detailed open-ended interview and questionnaire techniques used in his research are not available by observational and inferential methodologies. Central to Csikszentmihalyi's (1975b) inquiries into the nature of enjoyment is the assumption that "the crucial locus of psychological events is still the psyche; our thoughts and our feelings, not our 'observable' behavior, give meaning to life" (p. x).

It is to each individual's potential for growth and well-being that Maslow (1968) directs attention. In his positive, optimistic view of human nature, he theorizes that after basic, hierarchical deficit needs are satisfied, individuals strive to develop their capacities to the fullest and realize meta-needs. The following definition of self-actualization reflects the influence of Maslow's work on Csikszentmihalyi's formulation of flow theory.

> Self-actualization is an episode, or a spur in which the powers of the person come together in a particularly efficient and intensely enjoyable way, and in which he is more integrated and less split, more open for experience, more ideosyncratic, more perfectly expressive or spontaneous, or fully functioning, more creative, more humorous, more ego-transcending, more independent of his lower

> needs, etc. He becomes in these episodes more truly himself, more perfectly actualizing his potentialities, closer to the core of his being, more fully human. (p. 77)

According to Maslow (1968), peak experiences are "moments of highest happiness and fulfillment" (p. 73). They include characteristics similar to the flow elements proposed by Csikszentmihalyi. Analogous to the autotelic nature of flow is the peak experience quality described as a "self-validating, self-justifying moment which carries its own intrinsic reward . . . so great an experience sometimes that even an attempt to justify it takes away from its dignity and worth" (Maslow, 1964, p. 62). Similar to the loss of ego flow element, "ego transcending," "self-forgetful," and "egoless" are words used to describe the transcendence of self characteristic of peak experiences. Common to the conceptualizations proposed by both Maslow and Csikszentmihalyi is an intense concentration. "Narrowing of consciousness" is comparable to the process of centering of attention on a limited stimulus field identified in flow theory.

Although Csikszentmihalyi's (1975b) ideas are founded on assumptions about human behavior shared by Maslow, and they attempt to describe similar integrating and satisfying experiential phenomena, flow theory propositions are not as exclusive as those expressed in

self-actualization and peak experience literature. Csikszentmihalyi (1975b, 1978b) emphasizes the potential availability of finding enjoyment from a wide array of activities and at various intensities for all people. Maslow (1970) contends that peak experiences are more frequently and intensely experienced by mature self-actualizing individuals, and that self-actualization does not occur in young people. Further, Maslow suggests that peak experiences are only good and desirable and have no negative connotations associated with them. However, Csikszentmihalyi (1978b) acknowledges the possibility of enjoyment and intrinsic rewards deriving from negative activities such as burglary and waging war. The flow experience and intrinsic rewards are likened to physical energy.

> Both are powerful, both are neutral. They are valuable because they work for us, because they reduce the effort needed to accomplish a job. But it is possible to attach rewards to destructive activities, just as energy can be channeled for destructive ends. (pp. 214-215)

Intrinsic motivation. Intrinsic motivation is based on the assumption that internal processes are rewarding and important determinants of behavior. The activity is an end in itself undertaken for no apparent external reward. Persons engage in activities for their own sake, for the positive feelings derived from the activity, not for extrinsic rewards or goals realized at the completion of the endeavor (Deci, 1975). Unlike

deficit, mechanistic, homeostatic models of behavior, the conceptualizations of intrinsic motivation influencing Csikszentmihalyi's development of the flow model suggest that persons are active rather than passive in their continual interaction with the environment and that they experience enjoyment from their participation in intrinsic activities.

Literature on intrinsic motivation is fragmented rather than holistic; thus the research findings are not easily applied to everyday life. However, the numerous, relatively concrete and experimental studies do provide important implications about (a) characteristics of stimuli or activities that are enjoyable, and (b) feeling states persons experience relative to the enjoyment of activity. Both contributions are reflected in flow theory propositions.

Berlyne (1960) offers a relatively comprehensive set of theoretical concepts rather than merely naming singular motives to explain intrinsic, nondrive reduction behavior. Novelty, surprisedness, incongruity, uncertainty, and complexity are identified as stimulus properties in the environment that potentially enhance individuals' internal conditions. Berlyne proposes that intrinsically motivated behaviors are dependent on these collative stimulus properties that have arousal potential and thereby facilitate selected attention, exploratory

activity, and playful behavior. In addition to characteristics in the external environment, Berlyne suggests that individuals are capable of manipulating experiences symbolically and cognitively to generate self-arousal. In a factor analysis of items developed from Callois' typology of games, Csikszentmihalyi (1975b) identifies "a sense of discovery, exploration, problem-solving--in other words, a feeling of novelty and challenge" (p. 30), as the common variable that underlies autotelic activities.

Further, Berlyne (1960, 1966) integrates the concept of an optimal level of stimulation or arousal in his explanation of intrinsic motivation. The principle suggests that when one is suboptimally aroused, pleasure is experienced with the opportunity to interact with new and more complicated surroundings. Under conditions of supraoptimal arousal, decreased complexity, novelty, and uncertainty are satisfying.

White (1959), De Charms (1968), and Deci (1975) provide hypotheses about the feeling states individuals interpret as intrinsically rewarding. The three psychologists present alternatives to drive reduction explanations of behavior. Perceived control in one's interaction with the environment is common to their theoretical propositions and is also fundamental to Csikszentmihalyi's model of enjoyment.

White (1959) defines competence as the ability to interact effectively with one's surroundings. Directed, selected, and persistent behavior is undertaken to satisfy one's intrinsic need to deal with the environment. The feeling of effectance is the positive affective consequence of the behavior. Thus, exploration, manipulation, attention, perception, thought, and communication are interesting and intrinsically rewarding endeavors sought for the enjoyment they provide.

De Charms (1968) introduces the concept of personal causation to explain affective determinants of behavior. Intrinsic and extrinsic motivation are distinguished by an individual's knowledge or feeling of self-direction.

> Whenever a person experiences himself to be the locus of causality for his own behavior (to be an Origin), he will consider himself to be intrinsically motivated. Conversely, when a person perceives the locus of causality for his behavior to be external to himself (that he is a Pawn), he will consider himself to be extrinsically motivated. (p. 328)

The intrinsic dimension is the feeling of personal control in originating one's behavior. One's perception of being a causal agent is associated with free choice and commitment. Persons feel dependent when the source of reward is external. De Charms cautions that the addition of extrinsic rewards to activities pursued for their own sake may reduce rather than enhance motivation.

Deci (1975) presents a cognitive perspective to account for intrinsic motivation which focuses on thoughts and affective processes as determinants of

behavior. As in De Charm's model, personal knowledge of one's internal states contributes to a person's decisions about activities to pursue. Deci (1975) defines intrinsically motivated behaviors as "behaviors which a person engages in to feel competent and self-determining" (p. 61). The ongoing process of creating, seeking, and conquering challenges that require optimal use of one's abilities connotes effective interaction with the environment and satisfies one's need to feel competent and self-determining. Two classes of intrinsically motivated behaviors are specified by Deci (1975).

> The first involves seeking out situations which provide a person with challenge. The challenge will be one with which he has the ability to deal. If there is too little challenge (i.e., if he is bored), or if there is too much challenge, he will seek a situation which provides a challenge which he can handle. The second class of behaviors which are intrinsically motivated are ones which involve conquering challenges which he encounters or creates. (p. 63)

Deci (1975, 1978a) asserts that under varying circumstances extrinsic rewards have detrimental effects on intrinsic motivation and performance. Deci speculates that all rewards have controlling and informational aspects. The relative salience of these two processes determines whether the influence on intrinsic motivation is positive or negative.

> Although extrinsic rewards generally decrease intrinsic motivation, this need not be so if rewards

> are used simply as carriers of positive information about one's effectance rather than as controllers of behavior. . . . intrinsic motivation may be maintained or enhanced rather than undermined. (Deci, 1978a, p. 198)

Csikszentmihalyi (1978a) comments on the relevance of free choice in experiencing activities as enjoyable and relates this sense of control to the centering of attention flow element.

> Optimal experiences occur when a person voluntarily focuses his attention on a limited stimulus field, while aversive experiences involve involuntary focusing of attention. In other words, the individual's choice determines the quality of the experience. If . . . a person chooses to pay undivided attention to a set of stimuli, he or she will enjoy the experience. (p. 343)

In summary, fundamental to Csikszentmihalyi's flow theory are the following concepts which are found in the intrinsic motivation literature: (a) optimal levels of stimulation, (b) patterns of variables that offer new and complex opportunities for interaction in the environment, and (c) the desire to be a causal agent for one's behaviors. Csikszentmihalyi (1975b) comments on the direction and limitations afforded by these ideas in the development of the flow model.

> With their help we know that an enjoyable activity must involve a person's physical, sensory, or intellectual skills; and it must give the actor a feeling of being in control of his actions. But these criteria are still too general to help us describe autotelic activities, let alone understand them. (p. 25)

Barnett (1976) criticizes flow theory as a restatement of

optimal arousal theories, more restricted by the unnecessary association of feeling states with sub- and supraoptimal arousal. Csikszentmihalyi (1976) argues that the less global, more specific nature of his model offers greater potential for validation, application, and the possibility of yielding substantial, nontrivial knowledge about the experience of enjoyment.

Play. Csikszentmihalyi (1975b) speculates that since play provides both peak experiences and intrinsic motivation, it "could give the unifying concept needed to solve the riddle of why certain activities are enjoyable" (p. xiii). Csikszentmihalyi contends that "play is the flow experience par excellence" (p. 37). Theoretical propositions set forth in the flow framework are evolved from an early investigation of play by Csikszentmihalyi and Bennett (1971). Thus, the experiential state resulting from perceiving internal skills and external challenges in balance is originally called the play experience by Csikszentmihalyi. It exists between two other feeling states, worry and boredom.

Csikszentmihalyi observes that although play literature offers potential for providing insights into the process of enjoyment, it has three major limitations. First, play models are frequently developed to study social and psychological functions of intrinsically

rewarding activities and not the subjective experience per se. Similarly, emphasis on structural considerations of play activities diverts scholarly attention from the inner feelings of intrinsic rewards. Third, the deeply entrenched dichotomized perspective of work and play narrows the scope with which play is interpreted.

Csikszentmihalyi (1975b) offers a frequently ignored approach for studying play which emphasizes the subjective salience of enjoyment. Play is most often perceived as a means to investigate other ends and/or is addressed from a physiological rather than a psychological perspective.

> Earlier theories of play have focused on the long-range survival advantages to be gained from play: preparation for adult tasks, compensation for routine behavior, outlet for unexpressed needs. More recent theories have assumed that play provides stimulation needed to satisfy a physiological need for optimal arousal (Ellis, 1973). (p. 190)

Csikszentmihalyi is influenced by the spirit of play described by Huizinga (1955) and Callois (1979). Although both theorists offer thought-provoking perspectives of the phenomenon, they "seem to vacillate somewhat between defining play as a situation and defining it as an internal psychological state" (Harris, 1978, p. 63). Thus, Csikszentmihalyi (1975b) considers the resulting research emphasis on obvious structural distinctions of activities as an obstacle which "might close off

investigation instead of stimulating it" (p. 26), and direct attention away from the central issue of playfulness.

Stevens (1980) concurs with Csikszentmihalyi's evaluation of the status and limitations of play literature. Focus on the structural attributes of Huizinga's (1955) classic play definition, i.e., fixed rules, proper boundaries of time and space, not serious, no material rewards, and no profits, divert scholarly investigation from the inner psychological feeling dimension of playfulness. Stevens comments that ultimately Huizinga's experiential quality of "absorbing the player intensely and utterly," is ignored at the expense of other characteristics. Stevens compared Huizinga's experiential property with Csikszentmihalyi's flow concept.

> What Csikszentmihalyi labeled "flow" seems to me to be precisely that experience to which Huizinga was referring in his observation regarding the "intense and utter absorption" of the player in his play. We have concentrated on the other aspects of Huizinga's definition, and . . . looked at [them] from an external perspective, from an analytic framework which we have constructed from a distance and slapped onto the action from a distance--and we have ignored the fundamental dimension of what the performance of the act does for the actor himself. (pp. 319-320)

An essential problem of the play literature is the confusion between the behavior and the <u>experiencing</u> of behavior. Stevens stresses the need to distinguish play forms from play experiences.

Csikszentmihalyi (1975b) recognizes the need to eliminate the false conceptual dichotomy between play and work based on external structural considerations. Flow is potentially available in both work and play. The experiential criterion of enjoyment is a critical differentiating standard.

> What is both important and enjoyable is that a person act with the fullness of his or her abilities in a setting where challenges stimulate growth of new abilities. Whether the setting is work or play, productive or recreational, does not matter. (p. 202)

Miller (1973) expands the way of perceiving play beyond characteristics of an activity. This idea parallels Csikszentmihalyi's point of view of the subjective salience associated with the doing of an activity. The importance individuals attribute to the means and ends of behaviors is integrated in Miller's definition:

> . . . play is activity, motor or imaginative, in which the center of interest is process, rather than goal. There are goals in play, but these are less important in themselves than as embodiments in the processes involved in attaining them. (p. 97)

Thus, the opposite of play is not work but rather ends-oriented activity.

Harris (1978) proposes a perspective of play incorporating Csikszentmihalyi's three internal psychological states and Miller's distinction between process and ends-oriented activities. The possibility of experiencing enjoyment, as well as worry and boredom, in both play and goal-accomplishment behavior is conceptually acknowledged.

> Combining play and enjoyment and their related concepts, it might be possible for an individual to move in a psychological sense among the following internal perspectives while he engages in a particular activity: boring goal-directedness, anxious goal-directedness, enjoyable goal-directedness, boring playfulness, anxious playfulness, and enjoyable playfulness. In contemporary society there may well be a very considerable need to give greater cognizance to "enjoyable playfulness." (p. 71)

Csikszentmihalyi (1975b) contends that "it is not so much what people do but how they perceive and interpret what they are doing that makes activity enjoyable" (p. x). The central importance of a person's subjective interpretation of an activity is fundamental to Harris' ideas about play and goal-directedness.

> It is important to define both these concepts in terms of attitudes or internal perspectives rather than in terms of specific attributes of situations or activities because it is an individual's own perception of a situation which is important in his interaction with his environment, and each person processes incoming sensory information in a unique way. (Harris, 1978, p. 71)

Harris (1980) agrees with Csikszentmihalyi's conjecture that fluctuations occur in experiential interpretations of the same activity from moment to moment and over time. The relative strength of one's commitment to goal-attainment shifts within an activity or situation enabling a playful attitude to enter into any endeavor. The relative degree of goal commitment and playfulness associated with any activity is defined by one's subjective, cognitive processes.

Flow Constructs

Csikszentmihalyi's (1974, 1975a, 1975b, 1976, 1978b) flow model is an objective and analytic attempt to describe the subjective experience of enjoyment. Inherent in the comprehensive framework is an identification of the structural contexts which enable the flow feeling state. Although flow theory is relatively precise, Csikszentmihalyi cautions that it is a model and not the real phenomenon. Thus, the concepts proposed in his exploratory research of enjoyment are tentative. The propositions are intended to facilitate efforts for creating intrinsic rewards in everyday life. A description of the flow constructs and their relationships is presented and discussed for better understanding the nature of enjoyment in sport.

First, Csikszentmihalyi (1975b) differentiates among the overlapping concepts of autotelic or flow personalities, activities, and experiences. They are separate entities that contribute to intrinsic motivation.

Autotelic persons are characterized as individuals who tend to enjoy activities for their own sake, regardless of the external rewards associated with their endeavors. Csikszentmihalyi's (1975b) studies indicate that females, older people, and persons with more education and higher socioeconomic backgrounds tend to be more responsive to intrinsic rewards. Identification of personality variables

or dispositions that comprise a flow profile are not specified. However, Csikszentmihalyi (1975b) contends that "each individual undoubtedly has his own thresnold for entering and leaving the state of flow" (p. 52).

Activities are presumed to possess varying degrees of flow-producing potential. An autotelic scale or continuum differentiates patterns of actions that are structured to maximize the immediate intrinsic rewards. Csikszentmihalyi's (1975b) investigations reveal that activities with superficially different forms, i.e., rock climbing, competing in basketball, composing music, playing chess, performing surgery, and so forth, share the common autotelic function of enabling enjoyable experiences. It is Csikszentmihalyi's contention that the flow experience is largely dependent upon, though not limited by, the form of autotelic activities.

The flow experience is the essence of Csikszentmihalyi's model. It is the interface between a flow activity and a flow personality. Flow is the dynamic feeling state subjectively interpreted and characterized by a holistic sensation of total enjoyment.

Flow is determined by an individual's interactions with the environment. Csikszentmihalyi (1975b) theorizes that it is achieved under optimal conditions in which a person perceives his or her skills to be challenged by the demands of an activity. Therefore, congruity between

skills and challenges particular to a person and the situation define the flow experiential state.

Csikszentmihalyi's (1975b) theoretical model is illustrated in Figure 1. The framework suggests that a balance between one's perceived skills or action capabilities and the task demands or action opportunities of an activity results in flow. Other experiential states occur when the skill/challenge ratio is not balanced. An inadequate amount of skill in relation to the requirements of a situation results in worry. Boredom is experienced when an individual's capabilities are perceived to be in excess of the current set of challenges in the environment. An extreme mismatching of skills and challenges in either direction results in anxiety.

> When a person is bombarded with demands which he or she feels unable to meet, a state of anxiety ensues. When the demands for action are fewer, but still more than what the person feels capable of handling, the state of experience is one of worry. Flow is experienced when people perceive opportunities for action as being evenly matched by their capabilities. If, however, skills are greater than the opportunities for using them, boredom will follow. And, finally, a person with great skills and few opportunities for applying them will pass from the state of boredom again into that of anxiety. (Csikszentmihalyi, 1975b, p. 50)

Relationships among the experiential states of flow, worry, $\text{anxiety}_{\text{worry}}$, boredom, and $\text{anxiety}_{\text{boredom}}$ are represented in the figure.* Precise limits or transition

*Hereafter, $\text{anxiety}_{\text{worry}}$ and $\text{anxiety}_{\text{boredom}}$ are designated as $\text{anxiety}_{\text{w}}$ and $\text{anxiety}_{\text{b}}$.

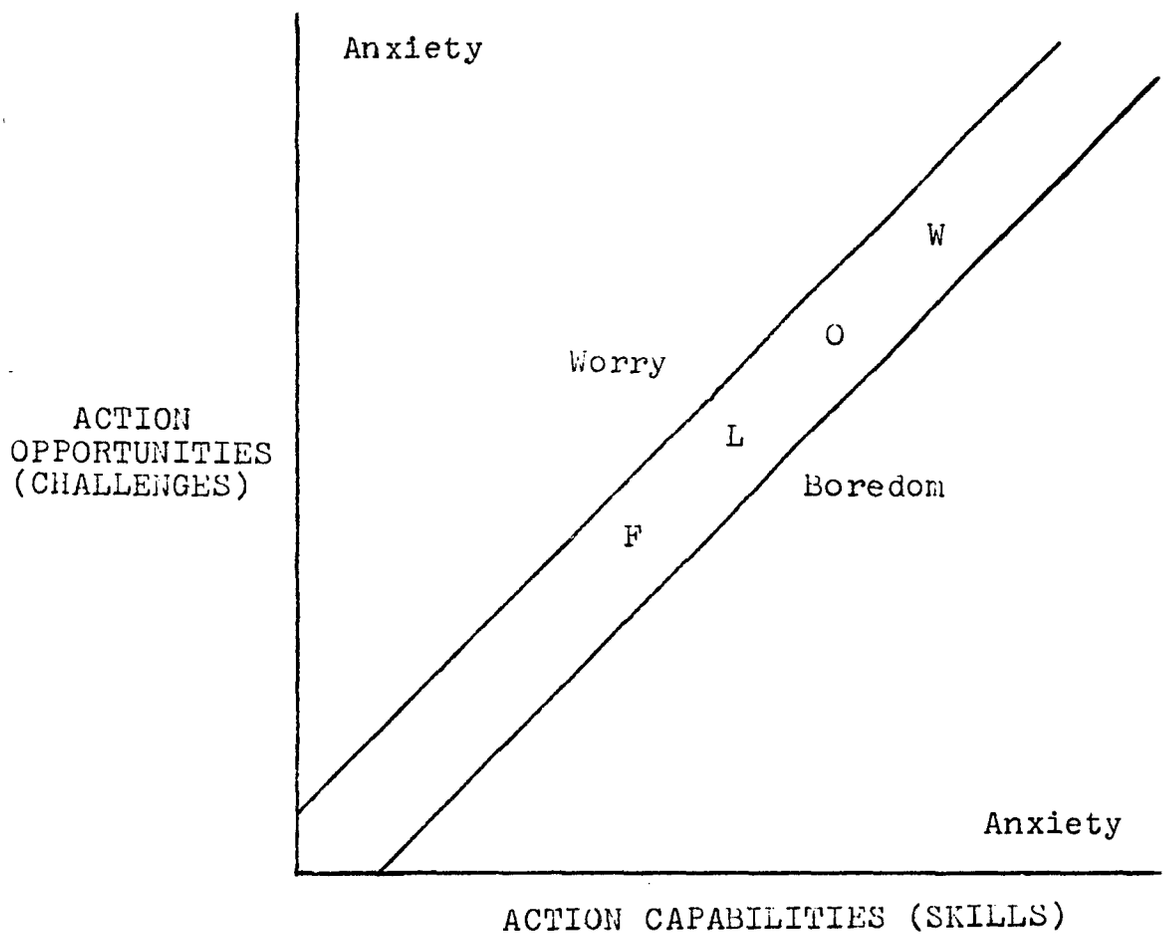

Figure 1. Model of the Flow State.

points are not identified. Rather, the model suggests various intensities of the feeling states that result from one's interpretations of available skills and challenges. An excessive incongruence between action opportunities and action capabilities produces anxiety rather than worry and boredom. Csikszentmihalyi (1975b) also theorizes that the flow experiential state exists on a continuum. Complex, structured activities that test the limits of a person's physical and intellectual potentials are associated with deep, full-fledged macroflow. Simple, unstructured activities that yield simple positive enjoyment such as doodling and daydreaming, characterize microflow.

Flow is highly individualistic. It depends entirely on a person's interpretations of skills and challenges specific to the moment and the task. Further, the constantly changing nature of feeling states as described in Csikszentmihalyi's on-going process of enjoyment account for intrapersonal as well as interpersonal differences in experiencing flow.

> "Skills" and "challenges" are not objective entities but flexible quanta dependent on cultural conventions and open to individual interpretation and change. (Csikszentmihalyi, 1975b, p. 191)

Csikszentmihalyi (1975b) offers a holistic approach for understanding the complex phenomenon of enjoyment. Physiological, cognitive and affective components are incorporated into the theoretical model.

> To provide intrinsic rewards, an activity must be finely calibrated to the person's skills--including his physical, intellectual, emotional and social abilities. (p. 100)

Therefore, it is possible to achieve and maintain the experiential state of flow in a variety of ways. This is particularly true for complex activities which provide both quantitatively and qualitatively different challenges, opportunities for action at several independent levels. Flow activities are open-ended in that they have "infinite ceilings and thus allow an indefinite increase in the development of skills or in the ability to organize experience" (Csikszentmihalyi, 1975b, p. 52). There is potential for individuals to adjust their perceived discrepancies in skill/challenge circumstances by symbolically restructuring the activity, seeking different external challenges or by acquiring increased competencies to adequately cope with the demands of a difficult situation. Learning how to structure experiences to derive more enjoyment for life is a valuable goal. Csikszentmihalyi's (1975b) theoretical propositions are formulated in an effort "to find out how this potential [for enjoyment] can be translated into actuality" (p. x).

Csikszentmihalyi (1978b) claims that any activity that takes place in a meaningful context and provides information about a person's abilities to cope with a set of challenges has the potential to create the inner feeling of flow. Intrinsic rewards are possible when an

activity meets the following requirements summarized by Csikszentmihalyi (1978b).

1. The activity should be structured so that the actor can increase or decrease the level of challenge being faced in order to match his or her skills with the requirements for action.
2. It should be easy to isolate the activity at least at the perceptual level from other stimuli --external or internal--that might interfere with involvement in it.
3. There should be clear criteria for performance: one should be able to evaluate how well or how poorly one is doing at any time.
4. The activity should provide concrete feedback to the actor so that one can tell how well one is meeting the criteria of performance.
5. The activity ought to have a broad range of challenges possibly several qualitatively different ranges of challenges, so that the actor may obtain increasingly complex information about different aspects of the self. (p. 213)

Csikszentmihalyi (1974, 1975a, 1975b, 1978b) describes the flow experience in terms of six flow elements or interrelated qualities that contribute to the subjective feeling of enjoyment. These flow elements that distinguish the inner feeling state of flow include: (a) merging of action and awareness, (b) centering of attention, (c) loss of ego, (d) control of action and the environment, (e) noncontradictory demands for action with clear, unambiguous feedback, and (f) autotelic nature.

The clearest sign of flow is the merging of action and awareness. Csikszentmihalyi (1975b) considers the nonduelistic, elusive, momentary sense of harmonious unity as most indicative of the subjective sensation of

flow. Flow cannot be intended or maintained while one reflects upon or analyzes the experience. Rather, flow connotes a natural unfolding of enjoyment that only occurs in the here and now process of interacting with the environment.

> Flow is a state characterized by internal logic of actions which require no conscious intervention. It is unified flowing from one moment to the next, in which there is little distinction between self and environment; between stimulus and response; or between past, present, and future. (p. 36)

Centering of attention on a limited perceptual field of relevant stimuli characterizes flow. Heightened concentration and total involvement and immersion in the task at hand are associated with the feelings of enjoyment. Csikszentmihalyi contends that activities characterized by clear rules for action and patterns of behavior, such as games and rituals, have the potential to facilitate this aspect of flow. Other flow inducers that minimize the intrusion of irrelevant or distracting variables and encourage an all-encompassing focusing of attention on relevant cues in the environment include competition, material rewards, and physical risks.

Loss of ego connotes an irrelevance of "self-ish" considerations. The loss of self-awareness or self-consciousness sometimes results in the feeling of transcendence, a sensation in which the body and actions "simply are." Acceptance of clearly articulated rules or conditions of an activity eliminate the need for persons

to negotiate the self in a social context. Thus, spontaneous interactions among individuals is encouraged as social roles are temporarily abolished. It is the sense of self that is characteristically lost in the flow experience and not an awareness of one's physical self. In fact, kinesthetic sensations and internal processes are often intensified. A rock climber describes the essence of the loss of ego flow element.

> The task at hand is so demanding and rich in its complexity and pull that the conscious subject is diminished in intensity. Corollary to that is that all hang-ups . . . I have as an individual person are momentarily obliterated . . . One tends to get immersed in what is going on around him in the rock, in the moves that are involved . . . so involved that he might lose the consciousness of his own identity and melt into the rock.
> It's like when I was talking about things becoming "automatic" . . . almost like an egoless thing in a way. (Csikszentmihalyi, 1975b, p. 46)

A sense of control in one's actions and the environment characterizes persons in the flow state. Elation, exhilaration, and the deep satisfaction of fulfillment result from an individual's perception of being able to cope with the action demands of a situation, i.e., a sensation of balancing current challenges with adequate capabilities. As Csikszentmihalyi conceives the control quality of flow, it is as much a sensation of not being worried about or threatened by the lack of control as it is one of mastery or an ability to affect one's environment. Active awareness of control may not be realized during a flow episode,

just as the harmonious unity of merging of action and awareness is different and only acknowledged in reflection.

Coherent, noncontradictory demands for action with clear, unambiguous feedback* about a person's actions is an essential quality of flow. In the artificially reduced reality characteristic of flow activities, goals and means are logically ordered and clearly articulated. The clarity flow element also suggests that confusion in assessing one's actions or performances is minimized. Evaluation is automatic and unproblematic.

The rewards inherent in flow activities come during the process of the endeavor rather than as products at its completion. The autotelic element of flow acknowledges the complete, self-validating nature of the experience which needs no goals, incentives, or justifications external to itself. Although conventional extrinsic rewards such as fame, status, and material success may coexist with the intrinsic rewards of enjoyment, they are considered incidental to the satisfaction one derives from doing the act.

In Csikszentmihalyi's early research, the flow phenomenon is called the autotelic experience. However, to eliminate the awkwardness of the somewhat formal label, and more importantly, to acknowledge the potential of enjoyment to be realized in any activity, the name is

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*Noncontradictory demands for action with clear, unambiguous feedback is called clarity in the remainder of the text.

changed to flow. Flow is the term selected by Csikszentmihalyi (1975b) because it frequently and spontaneously appears in respondents' descriptions of the subjective feelings of enjoyment associated with their activities. The following description is offered by a poet-rock climber and captures the autotelic quality and process-oriented essence of flow.

> The mystique of rock climbing is climbing; you get to the top of a rock glad it's over but really wish it would go forever. The justification of climbing is climbing, like the justification of poetry is writing; you don't conquer anything except things in yourself. . . . The act of writing justifies poetry. Climbing is the same: recognizing you are a flow. The purpose of flow is to keep on flowing, not looking for a peak or utopia but staying in the flow. It is not a moving up but a continuous flowing; you move up only to keep the flow going. There is no possible reason for climbing except the climbing itself; it is a self-communication. (Csikszentmihalyi, 1975b, pp. 47-48)

Csikszentmihalyi (1975b) speculates that the six flow elements are inexplicably interrelated. He summarizes the qualities and their interdependence. The experiential counterpart of flow activities is then described.

> By limiting the stimulus field, a flow activity allows people to concentrate their actions and ignore distractions. As a result, they feel in potential control of the environment. Because the flow activity has clear and noncontradicting rules, people who perform in it can temporarily forget their identity and its problems. The result of all these conditions is that one finds the process intrinsically rewarding. (Csikszentmihalyi, 1975b, p. 48)

> [Flow is] a contraction of the perceptual field, a heightened concentration of the task at hand, a feeling of control leading to elation and finally to a loss of self-awareness that sometimes results in a feeling of

> transcendence, or a merging with the activity and the environment. (Csikszentmihalyi, 1978, p. 213)

Related Research in Sport Utilizing Flow Theory

Although Csikszentmihalyi's theoretical propositions are acknowledged to have relevance for understanding concerns in sport, physical education, and leisure, empirical research utilizing flow theory to investigage aspects of behavior in these contexts is limited (D. V. Harris, 1975; J. C. Harris, 1978; McGirr, 1979; Mannell, 1980; Michaelis, 1980; Progen, 1978, 1979; Stevens, 1980). Comments about the worth of flow rather than applications of the theoretical formulations to generate data about persons' experiences in athletics, recreation, and physical education pursuits are common. Harris (1978) goes beyond discussing Csikszentmihalyi's ideas by integrating flow feeling states with concepts of goal-directed behavior and playfulness. But the resulting perspective of play and enjoyment is speculative and untested.

Progen (1978) and McGirr (1979) offer data-based studies in high-risk sports and golf utilizing Csikszentmihalyi's flow framework. The Sport Flow Q Sort developed for those investigations is revised and expanded for the present study.

The 60-item Sport Flow Q Sort developed by Progen (1978) to investigate stimulus seeking in high-risk sports yields evidence supporting Csikszentmihalyi's

theoretical framework. Responses to the open-format Q instrument are obtained from 96 sportspersons according to their perceptions of participation in whitewater canoeing and kayaking, parachuting, hang gliding, rock climbing, soaring, backpacking, cross-country skiing, and mountaineering.

The flow feeling state is overwhelmingly identified as most descriptive of the high-risk sport experience. Each of the flow elements is perceived to be characteristic of the activities investigated, and the order in which the six qualities are considered like the sorters is as follows: autotelic nature, control, centering of attention, clarity, loss of ego, and merging of action and awareness. As Csikszentmihalyi suggests, the flow elements are found to be interrelated entities.

The worry-anxiety$_w$ experiential state is moderately descriptive of high-risk sportspersons, and boredom-anxiety$_b$ is unlike the perceptions of the respondents. Csikszentmihalyi's prediction that anxiety$_b$ would be least characteristic of the sample because "active sport participation rules out excessive boredom almost by definition. . . . since they do sport exactly in order to avoid this anxiety boredom" (Progen, 1978, p. 98), is substantiated by the respondents' sorts and comments.

In general, the high-risk sportspersons in Progen's study acknowledge experiencing worry and boredom in their

activities, but to a far lesser extent than flow. Growth through skill development and the symbolic restructuring of the environment to create greater challenges are suggested as methods used to adjust perceived skill/challenge discrepancies. Thus, this finding lends credence to Csikszentmihalyi's premise that individuals are capable of employing various strategies to enhance the possibility of experiencing enjoyment in their endeavors. Quitting and seeking less difficult challenges to deal with feelings of worry, boredom, and anxiety are found to be unlike the sample of risk sport enthusiasts.

McGirr's (1979) study of 78 professional and high caliber amateur golfers provides additional support for the relevance of flow theory in understanding sport participation. Golfers' responses to a modified version* of the unforced Sport Flow Q Sort generate findings similar to those reported by Progen. The flow experiential state, including all flow elements, is interpreted as most descriptive of the golfers. Boredom-anxiety$_b$ is least characteristic of the athletes, and worry-anxiety$_w$ is considered somewhat like the golfers with statements representing this feeling state ranked throughout the sort.

Touring LPGA professionals and amateur golfers perceive their sport experiences similarly. Findings are

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*Statements were reworded to make special reference to golf, per se, rather than more generalized terminology.

statistically significant between the two groups for autotelic nature, loss of ego, and flow. Differences are tentatively attributed to external rewards associated with golf as a profession. High positive Spearman rank correlation coefficients between the sort responses of McGirr's golfers and Progen's high-risk sportspersons are found for all statements, .855, experiential states, .797, and flow elements, .990. Thus, the generalizability of the Sport Flow Q Sort to competitive athletes is supported.

Sport literature other than that directly derived from flow theory offers implications for the relevance of Csikszentmihalyi's model. Ravizza (1973, 1977) utilizes an open-ended interview technique to assess 16 athletes' subjective interpretations of their "greatest moments" in sport. Comparisons of the obtained personal sport experiences with descriptions of Maslow's peak experiences yield similarities that also parallel concepts proposed in flow theory: (a) total attention, (b) temporary loss of ego, (c) union with the experience as a whole (merging of action and awareness), (d) self-validating (autotelic nature), and (e) ultimately, enjoyable (flow). Ravizza argues that emotional and cognitive dimensions of sport can be very intense and are important aspects for understanding the total experience.

Murphy (1977) constructs a framework that compares the qualitative aspects of sports experiences with

altered states of transcendence associated with yoga. Although the propositions are not as comprehensive as the model presented in flow theory, they address sport specifically. The following intense, mystical altered states of consciousness are related to sport, and, in the writer's judgment, reflect flow constructs: (a) extraordinary clarity; (b) extraordinary focus and attention; (c) emptiness in which "the ego gives way to a void" (loss of ego); (d) equality, the "perception of oneness everywhere . . . all encompassing unity" (merging of action and awareness); (e) access to larger energies, insights and behaviors, "being lifted into other realms of power, beauty and invincibility" (control); and (f) ecstacy, delight, supreme aesthetic enjoyment (flow):

> The pleasures, joys, ecstasies that occur in sport are at the heart of playing. . . . Every athlete--professional or amateur, proficient or not so proficient whom I have questioned has said that enjoyment is the name of the game. (Murphy, 1977, pp. 23-25)

Q Technique

Q methodology acknowledges a comprehensive set of philosophical, psychological, statistical, and psychometric principles developed by Stephenson (1953) to investigate human behavior. It is implemented by Q technique, a sophisticated procedure for rank-ordering objects (items, verbal statements, pictures, and so forth), which are generally presented on cards. Objects are organized or

sorted into groups or piles along a continuum of self-description, approval, or preference according to some criterion. Varying numbers of cards are sorted into each pile and numerical values are assigned to the cards placed in each subset for statistical analysis (Kerlinger, 1973).

Providing an objective approach for studying subjective data is the central focus of Q methodology (Brown, 1968, 1977; Brooks, 1970; Rinn, 1961; Stephenson, 1968). In the Q sort process, each object is evaluated relative to all of the other items representing the population universe of a phenomenon under investigation. Therefore, Q technique is a comparative method rather than an absolute one. Items are interpreted from each sorter's personal frame of reference and not from preassigned values imposed by the researcher (Nunnally, 1978). Perhaps Stephenson (1968) overstates the objective value of Q methodology by his claim that it is probably the only way to achieve scientific leverage on the problem of subjectivity that retains a self-reference quality. However, a primary advantage of Q technique is that individuals provide their own frames of reference for responding to the concepts built into Q instruments.

> The sorter is saying . . . "In my opinion . . .," or "I feel . . ." and the like. The subjectivity is his in a self-reference sense. . . . He has expressed his subjectivity operantly, modelling it in some manner as a Q sort. It remains his viewpoint. (Stephenson, 1968, pp. 500-501)

Reviews of the Q research literature by Wittenborn (1961) and Brown (1968, 1977) reveal numerous applications of Q technique for studying behavior. Once a technique primarily employed in psychological investigations, an increasing number of contributions from the social sciences, with the exception of anthropology and sociology, indicates a trend of expanded utilization. The primary use of Q technique is as a measurement tool or procedure for collecting data outside the context of the more comprehensive methodology proposed by Stephenson. A "faddish" quality characterizes Q studies in that investigators infrequently use Q sorts for more than one study.

Unstructured Q sorts dominate studies using Q technique. This type of Q sort is comprised of randomly chosen items assembled without regard to underlying variables either in the construction of the instrument or in the analysis of the sort responses. Application to one broad domain and adequate representation of that area of study are the only criteria for selection of the Q sort items. Correlation analyses are typically employed to compare intrasorter and intersorter responses to the unstructured Q sorts.

Perhaps the greatest potential contribution of Stephenson's Q technique is disregarded by the unstructured, faddish approach of the majority of Q sort research. That

is, according to Kerlinger (1973), "its close affinity to theory" (p. 594). In a structured Q sort, the variables of a theory or hypotheses about a phenomenon are differentiated and systematically built into the design of the sort. Conceptually structured sets of Q items are constructed to epitomize theories. The essence of Q technique is to test theoretical propositions built into the cards of the instrument. Rinn (1961) asserts that the limited scope encompassed by Q sort instruments serves a valuable purpose.

> To be useful, a system of concepts (theory) need not cover the total range of phenomena in the area to which it applies. If a conceptual model can be shown to systematize a substantial number of important empirical relationships, it may contribute to later theoretical formulations (p. 319)

In the present study, flow constructs are proposed to systematically explain intrinsically rewarding experiences and to complement existing models of motivation.

There are two basic constraints on the generalizability of data generated by Q technique. First, there is the limited nature of the domain of behaviors represented in the Q sort. Second, the Q sample represents what Stephenson (1953) identifies as a "single case," i.e., a single person or homogeneous group of persons (Neff & Cohen, 1963). Thus, "one tests theories on small sets of individuals with 'known' or presumed possession of some significant characteristic or characteristics" (Kerlinger, 1973, p. 598).

A criticism of Q technique is that its validity has not been systematically or extensively investigated. However, proponents of Q contend that it has a face validity if statistical analysis of the sorts yields "empirical relationships that . . . [are] coherent with the theoretical framework that prompted the research. . . . The validity of a Q set rests on a 'reasonable' relevance of the operations to the construct under investigation" (Brooks, 1970, p. 177). Validity of a theory emerges if the Q sort items adequately represent the theory and if persons with "known" characteristics sort the items in an expected way (Neff & Helfand, 1963; Kerlinger, 1973).

Because of the self-sort nature of Q technique, reliability of Q sorts is a problem to confirm because it cannot be properly established by traditional split half, matching items, or alternate form methods. Test-retest methods are more commonly used (Brooks, 1970; Frank, 1956; Hess & Hink, 1959; Neff & Helfand, 1963). Neff and Helfand (1963) suggest that low correlations between test and retest sorts may reflect (a) inaccurate representation of theoretical constructs in the sample of Q items, (b) the inability of subjects to understand the items or to respond to them in a consistent way, or (c) a deficit in the theory under investigation.

Controversy also exists regarding the preference of the forced and unforced formats of Q sort procedure. The majority of Q studies utilize the forced-choice response approach for the advantages of straightforward comparisons between sorts and computational convenience. Forced sort conditions require all respondents to make the same number of discriminations among the Q items in a predetermined distribution which usually approximates a normal curve. Thus, the response set of each sorter is standardized. Block (1956), Brown (1971), Nunnally (1978), and Livson and Nichols (1956) favor the forced Q sort format. Block (1956) and Livson and Nichols (1956) cite the superior reliability and a tendency for sorters to make more discriminations among the Q items as part of their rationale for supporting a prescribed forced sort format.

Proponents of the unforced or free sorting procedure argue that the forced distributions of items is constraining and potentially destroys spontaneity in the sorting exercise. Further, the possibility of distortion or inaccurate expression of the sorters' self-descriptions is increased by the unnatural, unreasonable, and artificial requirements characteristic of the forced Q sort. The free or open sort procedure advocated by Jones (1956), Gaito (1962), and Cronbach and Gleser (1954) requires sorters to discriminate among the Q items along a

continuum containing a set number of self-descriptive categories, but the unforced procedure does not dictate the specific distribution in which the items are arranged. Another strength of the free sort format is that important statistical information, means and standard deviations, are not systematically lost as in the standardized forced condition of Q.

Brown (1972) contends that the ordering preference of items is more important than the type of distribution employed. Comparing identically ordered sorts having different distributions using Spearman's r, Kendall's tau, and Pearson's r, "the same results are obtained, despite distribution and whether interval or ordinal statistics are used" (p. 283). Cronbach and Gleser (1954) and Butler and Fiske (1955) advocate the use of nonparametric statistical approaches in assessing Q sorts.

Practical advice in designing studies using Q technique is offered by Kerlinger (1973). Since neither the forced or free sorting procedure is universally superior, nor is there one preferred arrangement for distribution of the Q items, the nature of the inquiry and the judgment of the researcher determine the appropriateness of the sorting procedure and distribution. The number of items comprising a Q sort also depends on convenience and statistical demands as perceived by the

investigator. Between 60 and 90 items are recommended for statistical stability and reliability. However, as few as 40 items may be appropriate to adequately represent the particular theoretical framework or topic under investigation.

The flexibility and utility of Q technique as a research tool are summarized by Kerlinger (1973) as follows: (a) a close affinity to theory; (b) appropriateness for intensive study of the individual; (c) a heuristic quality and strength in exploratory research; and (d) extensive possibilities for statistical analysis including analysis of variance, factor arrays, and correlational methods. According to Kleban (1980) the "value of Q technique resides in its superb capacity to integrate and organize phenomena" (p. 111). Brown (1977) is optimistic that changes he perceives in the social climate which emphasize person-centered values may result in an increased interest in studying subjective aspects of behavior for which Q technique is deemed appropriate.

CHAPTER III

PROCEDURES

This investigation was designed to explore collegiate athletes' perceptions of their competitive sport experiences according to propositions set forth in Csikszentmihalyi's flow model. The following procedures were undertaken in the conduct of the study: (a) revision of the Sport Flow Q Sort (Progen, 1978), and preparation of testing materials for administration of the instrument; (b) selection of a sample of collegiate athletes; (c) administration of the sort; (d) organization of the data for analysis; and (e) determination of analytic procedures for interpretation of the data.

Instrumentation

Revision of the Sport Flow Q Sort

The Sport Flow Q Sort developed by Progen (1978) was the research tool selected for the generation of the data regarding collegiate athletes. The Q sort was designed to systematically represent the theoretical constructs proposed by Csikszentmihalyi (1974, 1975a, 1975b, 1978b) in the context of sport. In other words, the theory was embodied in the Sport Flow Q Sort by building flow experiential states and flow elements into the items comprising the inventory.

A forced distribution of the sort responses was obtained in the collection of the data. The athletes were required to arrange the statements in a pattern that approximated a normal distribution.

There is considerable controversy regarding the preference for the forced and unforced response patterns to a Q sorts. Block (1956), Brown (1971), Livson and Nichols (1956), and Nunnally (1967) advocated the forced format primarily for computational convenience and straightforward comparisons. Gaito (1962) and Jones (1956) argued that imposing a fixed distribution potentially destroyed spontaneity in the sorting exercise and distorted accuracy of the respondents' self-perceptions. Progen (1978) found that the high-risk sportspersons using the open format of the Sport Flow Q Sort arranged the items in a variety of patterns. The mean number of statements placed in each column of self-description was opposite that of a normal curve, with more items sorted in the extreme columns of the sort continuum than in the middle. Therefore, evidence exists which suggests that the imposition of a forced format may constrain the sorters' responses to the point that perceptions of the flow experience in sport were distorted.

However, the statistical appropriateness of requiring a normal distribution of the items was an overriding consideration for the purposes of the present

research. The underlying conceptual foundation of factor analytic technique utilized in the study was based on the assumption that the data were normally distributed. Therefore, if underlying factors of flow theory do exist in the Sport Flow Q Sort, as measured by collegiate athletes' responses to the Q items, they were more likely to emerge if a forced response format was employed.

The basic design of the Sport Flow Q Sort (Progen, 1978) incorporating equal representation of the three experiential states and six flow elements was retained for the study as were the six nonflow items. However, the sort was expanded to convey aspects of flow theory not structured into the original instrument. Twenty additional items were constructed to more comprehensively represent Csikszentmihalyi's theoretical framework.

Statements specifically signifying the matching of skill and challenge to achieve the enjoyable experiential state of flow were developed for each of the six flow elements: (a) merging of action and awareness, (b) centering of attention, (c) loss of ego, (d) control of action and the environment, (e) noncontradictory demands for action with clear, unambiguous feedback, and (f) autotelic nature. The flow statements in the original Q sort purportedly characterized the flow elements but did not present them in the context of a balanced ratio between one's perceived skills and the challenges of the

sport environment. The manner in which flow elements were typically expressed in the original Q sort is reflected by the centering of attention Statement 6, "When I am really into my sport, I concentrate so completely that I am not distracted by other things." The congruity between action capabilities and sport challenges is reflected in the added skill/challenge, s/c* centering of attention Statement 72, "When my skills evenly match a difficult event, I enjoy the feeling of total absorption in my performance." Two flow experiential state items depicting the balance of skill and challenge necessary for experiencing flow were expressed in general terms without regard to a specific element or quality. The flow s/c feeling state is conveyed in general terms by Statement 53, "Participating in sport is most enjoyable when a challenging event tests the limits of my skills."

Items relating each flow element to the boredom and worry feeling state categories were part of the revised instrument development. Although incongruity between skill and challenge was connoted in the initial sort items, the imbalance was not expressed with regard to the six flow elements. Statements 61 and 36 illustrate the new worry and boredom experiential state items

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*Hereafter, the symbol s/c refers to sort items specifying the matching of skill and challenge with regard to the flow elements.

relating to the clarity flow element that exists outside the parameter of the flow channel. "When my skills are inadequate for a difficult event, worry makes me unsure of the 'right' skill to perform," and "When an event is too routine to challenge my skill, my decisions are so obvious that I become bored." Note that flow elements were distinguished from flow experiential states in these items. Thus, the possibility of studying flow elements outside the enjoyable state of the flow channel and relative to worry and boredom was created.

Statement revisions were made to clarify and more accurately represent constructs proposed in Csikszentmihalyi's flow model. The double meaning and ambiguous nature of Statement 32 in the original sort was corrected and phrased in a positive context. Thus, the merging of action and awareness statement intended to capture the "here and now" nature of flow was changed. "The high I achieve in sport only occurs while I'm doing the movement; it's lost when I reflect on it," was restructured to Statement 1 in the revised instrument. "I experience more joy and satisfaction while I am actively engaged in my sport than in thinking about past events or future performances."

Respondents to the previous Progen (1978) study involving high-risk sportspersons indicated difficulty interpreting the $anxiety_b$ items with regard to their

activities. Therefore, revisions were made by restructuring some of the statements in the feeling state category. By substituting words for anxiety, which has many connotations, and by pairing the term with words connoting irritation and frustration, statements were altered to capture the essence of the experiential state as proposed by Csikszentmihalyi. For example, Statement 63 was refined by adding the notion of frustration associated with having an excess of skill for the difficulty of a sport challenge, "When a situation is misclassified by over-rating its difficulty, I feel frustrated and anxious about not having opportunities to exercise my skills."

The revised Sport Flow Q Sort consisted of 80 statements. The flow experiential state was represented by four statements for each of the flow elements, one of which specified the matching of skill and challenge associated with attaining the flow feeling state. Two general flow items, ideas not associated with a particular flow element, were also incorporated into the instrument. An excess of sport situation challenges in relation to one's perceived skills was expressed in 24 worry items. Nine statements reflected worry. Nine items connoted the extreme mismatching of skill and challenge that constituted intensified worry or the anxiety$_w$

dimension of this experiential state. Worry in the context of the flow elements was encompassed in the remaining six worry statements. The feeling state category of boredom consisted of 24 items connoting a more than adequate amount of skill to cope with the task demands of sport. Nine of the statements conveyed the incongruity in the skill and challenge ratio. The nine $anxiety_b$ items reflected the intensity of the disparity in one's perceptions of skills related to challenges, and six statements suggested the specific characteristics of the flow elements. Six nonflow statements completed the instrument.

The 80 statements comprising the revised Sport Flow Q Sort are presented in Appendix A. Experiential state categories and subcategories are designated. Flow elements specifying the matching of skill and challenge are indicated by the symbol s/c. Worry and boredom statements pertaining to the particular flow elements are also identified accordingly.

Preparation of Materials for Administration of the Sort

Preparation of the sort materials included: (a) the random numbering of all the statements, (b) production of each item on a 3 x 5 heavy bond card, and (c) duplication of complete sets of statements. Eighty sort decks were assembled. Refer to Appendix A for examples of the cards comprising the Sport Flow Q Sort.

Response sheets were prepared to accommodate 80 statements included in the instrument and to reflect the forced format for arranging the statements in a normal distribution. The eleven columns were labeled from A to K and corresponded to the athletes' perceptions of self-description along a continuum ranging from "most like me" to "least like me" with regard to their collegiate sport experiences. The response form is also included in Appendix A.

Instructions for the sorting procedure were prepared. Explicit written directions detailing the sorting procedure were developed to guarantee that all respondents had uniform and consistent information for completing the sorting exercise. A copy of the sort directions is presented in Appendix A.

A brief questionnaire was developed to ascertain information about the respondents participating in the study. Gender, sport, university/college affiliation, and age as well as background information about the athletes' experiences in the particular sport with which respondents were associated were items on the questionnaire. Number of years of participation, highest level of competition, and the degree of preference of the designated sport for the study compared to other sports were other items of information obtained. Identification of these data about the respondents was secured for interpretation

of the Sport Flow Q Sort items. Appendix A contains a copy of the questionnaire.

An informed consent form describing the purposes of the study and delineating the nature of the athletes' participation in the research was prepared in accordance with University of North Carolina at Greensboro regulations. Voluntary participation, anonymity of responses, opportunity for withdrawal, knowledge about the purposes and procedures in the study, and the availability of a summary of results at the completion of the project were specified in the informed consent form. See Appendix A.

For convenience in coding the data and translating the athletes' responses to numerical values, a conversion sheet was developed. A copy of this form used to transfer the raw data to computer cards for statistical analysis is also included in Appendix A.

Sample Selection

Coaches and athletic directors of 120 teams were contacted by letter to inform them about the purposes and procedures of the study and to invite the participation of their teams in the project. Considerations made in identifying those asked to take part in the research included (a) location and travel distances to the college campuses, (b) specific sport activities that were "in-season" or conducted spring training during the

semester of the data collection, and (c) affiliation with either AIAW, NCAA, or NAIA sport organizations. Diversity in both sports and competitive levels to obtain reflections upon a wide variety of intercollegiate sport experiences available to men and women athletes was a study goal. It should be noted that volunteers only participated in the research.

Upon receipt of a response indicating willingness to join the research endeavor, coaches were telephoned and/or sent letters to establish and confirm visitation times and dates convenient for the teams. Procedures for the data collection session were outlined at that time. In order to involve the greatest possible number of athletes from among those invited to take part in the study, coaches who failed to respond to the initial request for subjects were contacted by telephone to personally appeal for their cooperation in the research. Correspondence to coaches and athletic directors is presented in Appendix B.

Sort Administration

Data collection involved travel to some campuses in North Carolina, Tennessee, and Virginia between March 28 and May 18, 1980. Added responses were also obtained by mail. During the fall semester of 1980, test-retest data were collected from two field hockey teams. Responses from 464 men and women athletes representing 39 teams and

22 institutions of higher education to the Sport Flow Q Sort and questionnaire were obtained. Participants competed in the following 11 intercollegiate sports: baseball, basketball, field hockey, football, golf, gymnastics, lacrosse, softball, tennis, track, and volleyball. The names of colleges and universities with which athletes participating in the study were associated are listed in the data code plan contained in Appendix C.

Administration of the sort and questionnaire was accomplished by the investigator at times and places convenient to the coaches and athletes. The usual procedure was for the data-gathering session to take place on the team's campus. The administration of the sort occurred at various times: prior to and/or after practices, following team competitions and meetings, and during sessions specifically arranged for participation in the study. It was not possible to standardize these procedures. Coaches' suggestions and athletes' availability were given primary consideration in determination of when data were collected.

The investigator supervised the collection of the data with few exceptions. A graduate student trained in the administration of the Q sort assisted with the procedure on several occasions and administered the testing materials to the members of three teams. This took place when a conflict in the data collection schedule did not

allow the investigator to be present. The responses of 12 women golfers were obtained by a coach experienced in Q sort procedures. The competitive schedule precluded person-to-person contact with the members of two teams willing to participate in the study. Responses from 13 athletes of these groups were obtained by a mail procedure. To insure anonymity, separate self-addressed stamped envelopes were provided for returning the informed consent form and the completed testing materials.

Data collection procedures customarily began with a description of the purpose of the study. The expectations of athletes' involvement in the project as outlined in the informed consent form were explained. Then, those who volunteered for the study completed the form.

Packets of materials containing (a) a questionnaire, (b) sort response sheet, (c) sort directions, (d) a Q deck of 80 cards, and (e) a pencil were distributed to the respondents. Directions about the sorting exercise were given. It was emphasized that responses were to be made about how the athletes generally perceive their experiences with regard to the specific sport with which they were affiliated for purposes of the study at the time of data collection. Thus, sport affiliation was established. This precaution was made for two reasons. First, athletes were encouraged to consider the broad ranges of their sports experiences, and not to limit their

responses to the most recent practice or most memorable competition, for example. Second, the Sport Flow Q Sort is sport-related in its terminology and does not contain words and meanings particular to sports such as baseball, golf, tennis, and so forth. It was acknowledged that some of the athletes in the sample competed on other intercollegiate teams. However, their responses were interpreted in terms of the designated team affiliation at the time of sorting the Q deck.

The number of athletes included in each data collection session ranged from two to 51. Completion of the materials took from 40 minutes to one hour. Larger groups tended to take longer. Some individuals completed the Q sort in as little as 30 minutes. As subjects finished the sorting exercise, materials were returned to the investigator and superficially inspected for completeness. A sign-up sheet to receive information about the project results was available.

To check the reliability of the sort, 50 members of five teams participated in two administrations of the Sport Flow Q Sort. Forty responses were complete and error-free. Data from 17 athletes affiliated with softball, tennis, and volleyball were included in the reliability testing as were the sorts of 23 field hockey players which were obtained later in the 1980 fall semester. The sessions were scheduled from two to four weeks apart.

Athletes were advised in the initial meeting that they would be asked to participate in a second session.

Organization of Data for Analysis

A coding plan was devised to translate the raw data reported on the questionnaire and Sport Flow Q Sort to quantitative values. Each subject's responses were prepared for statistical analysis using the numerical conversion sheets. Appendix C contains the coding plan developed to organize the data. Quantitative values ranging from eleven to one were assigned to each of the 80 sort items. A score of eleven was recorded for statements placed in the "most like me" Column A, and the "least like me" items sorted in Column K received a value of one. Numerical value designating the various degrees of self-description reported by the athletes in the sorting exercise were assigned as follows:

Self-reference Column	Most Like Me A	B	C	D	E	F	G	H	I	J	Least Like Me K
Numerical Value	11	10	9	8	7	6	5	4	3	2	1

Of the 409 Sport Flow Q Sort responses obtained during the spring semester of 1980, 318 were retained for statistical analysis. Errors in the sorting procedure resulted in the elimination of 91 response forms. Failing to record the number of one or more statements while duplicating others on the response sheet was the most common error. Other responses were

omitted because the sorts were incomplete. Improper identification, i.e., not being able to match the questionnaire with a response sheet, was the cause of further loss of data. The responses of team managers were eliminated from the analysis. In general, more sort errors occurred in large group administrations of the instrument. Although the amount of lost data seems excessive, the remaining 318 responses were considered sufficient to perform the desired analytic calculations.

Rationale for Analytic Procedures

Statistical computations were carried out at the University of North Carolina at Greensboro Academic Computer Center using programs of the Statistical Analysis System, SAS (Barr, Goodnight, Sall, Halwig, 1976). Analytic procedures included the generation of (a) descriptive statistics, (b) correlation coefficients to assess relationships among flow theory constructs and test-retest reliability data, (c) factor analysis statistics, and (d) t-test and analysis of variance tests of significance to assess differences among the athletes' sorts according to gender and sport affiliations. Scheffé tests were calculated to determine which sport pairs were statistically different.

Descriptive Statistics

Means and standard deviations were obtained for (a) each of the 80 Q statements, (b) the flow experiential state categories and subcategories, and (c) the six flow elements. The descriptive data were generated for the total sample of athletes and for subsamples of respondents differentiated by gender and sport affiliation. Q item means enabled the ranking of statements according to the respondents' self-descriptions of their sport experiences. Descriptive information about the characteristics of the athletes comprising the sample was also provided.

Correlation Analysis

For determining relationships among the constructs proposed in Csikszentmihalyi's flow model, correlation coefficients were computed. Despite the forced normal distribution imposed on the Q sort responses, Q data were ordinal. Therefore, nonparametric measures of association were generated. Kendall tau correlation coefficients accommodate ties in the responses, and therefore were utilized to assess the magnitude and direction of relationships among the flow theory constructs.

Test-retest reliability of the instrument was also determined by Kendall tau correlation coefficients comparing responses of 40 athletes to two administrations of the Sport Flow Q Sort. Because of the self-sort nature

of Q technique in which item values are comparative rather than absolute, a correlational method of assessing reliability was deemed more appropriate than traditional split half, matching item, and alternate form procedures.

Factor Analysis

Factor analysis is a powerful, useful, and flexible method of uncovering order and patterns in data of complex and diverse behavioral phenomena. It is a mathematical tool of scientific parsimony. Data are reduced, i.e., simplified, by extracting highly correlated, interrelated clusters of underlying variables from a larger number of measures. Factor analysis is both an exploratory method in which relationships among variables are discovered and an inferential technique in which hypotheses are tested to confirm expectations about dimensions underlying the variables. Exploratory applications are most common (Child, 1970; Kim & Mueller, 1978a, 1978b; Kerlinger, 1973; Rummel, 1970).

Although interval data provide the best results in factor analysis and data generated by Q technique are ordinal, Rummel (1970) and Kim and Mueller (1978b) argued that data satisfying rank measurement criteria are acceptable for meaningful application of factor analysis. Since factor analysis is an exploratory and somewhat arbitrary method of analysis, stringent measurement criteria of variables underlying the analysis are not

essential unless the procedure is performed for strictly confirmatory purposes.

Another consideration for selecting variables or Q items subjected to factor analysis was their hypothetical relevance to the phenomenon being studied, the flow theoretical framework. Rummel (1970), Child (1970), and Kerlinger (1973) maintained that variables entered into factor analytic inquiries for both hypothesis testing and exploratory purposes must be carefully chosen and have a legitimate purpose in the investigation. Thus, flow theory constructs were systematically built into the Q items, and may emerge in the resulting factors generated by the analysis. Information about their relationships was potentially available. Kim and Mueller (1978b) considered all factor analysis self-validating to a degree in that it provides a method for checking theoretical expectations at whatever level it is applied.

A minimum eigenvalue of 1.0 was the rule-of-thumb criterion used for extracting factors in this study. Each factor retained in the analysis, therefore, explained as much or more of the variance than the individual variables, Q items, underlying the factors (Rummel, 1970).

Child (1970) advocated a .3 cutoff value as a rigorous level for assessing the significance of the factor loadings. It was the initial criterion accepted in the research. Inspection of the generated factor loadings,

however, suggested a .4 cutoff value provided a clearer interpretation of the factors, and was thus used in the data analysis. Since discovering meaningful relationships among the variables entered into factor analysis is the essence of the technique, adjusting the factor loading significance level to better explain the factors was acceptable. It demonstrated the flexible nature of factor analytic technique in exploratory research. According to Kerlinger (1973), factors cannot be assumed to represent reality, they are "always tentative and subject to later confirmation or disconfirmation" (p. 688).

Rotations of the principal axis factors were executed to provide more meaningful interpretations of the variance underlying the factors. Therefore, factors in this study were rotated, using both orthogenal and oblique procedures. Because of the similarity of the results of the varimax, quartimax, and promax rotations, only one, the orthogonal varimax solution, was selected for discussion in the analysis. This judgment was made because of the simplicity of the solution.

Analysis of Variance

A one-way analysis of variance was computed to test the significance of difference among the means of each flow experiential state and flow element generated by athletes with different sport affiliations. Variability between sport groups that exceeded within group

variability, i. e., variability due to chance or random error, by a criterion determined by the degree of freedom, suggested actual differences in the athletes' responses to the Sport Flow Q Sort. Sums of squares, degrees of freedom, F ratios, and significance levels of the F ratios were computed. F ratios at the .05 level of confidence were considered significant. Since women and men athletes were not represented by a substantial number of respondents in each of the sports to aid in interpreting the data, separate ANOVAs were calculated for women athletes in golf, lacrosse, softball, and tennis, and for men athletes in baseball, football, golf, lacrosse, and track.

According to Kerlinger (1973), it does not matter whether t-tests or ANOVA F ratios are used to determine statistical differences between two groups. He argued that since identical findings are yielded by the two procedures, t is a special case of the more general F test. T-tests were, therefore, considered appropriate statistical measures for determining gender differences in the athletes' responses.

Scheffé

In analysis of variance, a significant F test simply indicates overall differences somewhere in the data. It does not signify which means contribute to the significance. Unlike the t-tests used to identify gender differences,

inspection of the relative sizes of the means cannot accurately indicate sources of significance among the sport means because more than two groups were compared. The Scheffé test was the post hoc method used to determine which Q sort responses were significantly different when considering sport affiliations

The Scheffé multiple comparison test is a method for comparing all pairs of means after a significant ANOVA was obtained. It was the statistic used to determine which Q sort responses were significantly different when considering sport affiliation for several reasons. Roscoe (1975) noted that the Scheffé test was applicable to data with unequal sample sizes for the groups in comparison, a condition characterizing the Q data. Kerlinger (1973) cited the advantages of flexibility and generality of the Scheffé test for exploratory and interpretive purposes in comparing group means. He added that because it is a conservative procedure, the likelihood of finding differences between sample means that do not exist is minimized. However, the substantial differences in the group means needed to detect significant differences may result in not achieving significant Scheffé tests indicated by significant ANOVA results.

CHAPTER IV

ANALYSIS OF DATA

Collegiate athletes' responses to the Sport Flow Q Sort are subjected to statistical analysis to answer the questions framing the investigation. The data obtained to explore Csikszentmihalyi's flow theory constructs in sport are presented in the text which follows. Due to the extensive nature of the complete statistical information generated in the study, all Q data tables are presented in the appendix to facilitate the reading of the text. First, a description of the respondents is presented. Second, descriptive statistics of the 80 items of the instrument and for the flow experiential states and flow elements are reported for: (a) all athletes, (b) women and men athletes, and (c) sports represented by a minimum of 20 respondents. Next, relationships among the flow experiential states and among the flow elements are offered. Fourth, a correlational analysis of test-retest reliability data for a subsample of athletes is reported. Fifth, results of a factor analysis of the Sport Flow Q Sort statements are presented. Finally, findings for analysis of variance and t-test procedures to compare both sport and gender differences conclude the chapter.

Description of Respondents

Data from 341 men and women collegiate athletes representing 11 sports, 39 teams and 22 institutions of higher education are used in the analysis. Responses from 23 field hockey players are only included in the test-retest reliability aspect of the study. Of the remaining 409 responses to the Sport Flow Q Sort, 318 are complete and error-free, and therefore, used in the other statistical analytic procedures. Gender and sport data are reported in Table 1.

Sport Flow Q Sort Descriptive Data

The 80 statements comprising the Sport Flow Q Sort are rank ordered according to mean scores in Tables A to J. Descriptive data include statement ranks, means, and standard deviations. Flow experiential state and flow element categories are also indicated. Table A presents information about the total sample of 318 athletes. Tables B and C provide statement data for women and men athletes respectively. Descriptive statistics for sports associated with a minimum of 20 respondents are reported in Tables D to J: (a) baseball, (b) football, (c) golf, (d) lacrosse, (e) softball, (f) tennis, and (g) track. All tabled data are presented in Appendix D.

Since the forced sorting format of Q technique requires each respondent to arrange the 80 statements of

Table 1

Gender and Sports of Respondents

Sport	Gender		
	Women	Men	Total
Baseball		28	28
Basketball		6	6
Field Hockey	23		23
Football		31	31
Golf	19	23	42
Gymnastics	8		8
Lacrosse	50	29	79
Softball	32		32
Tennis	22	12	34
Track	16	31	47
Volleyball		11	11
Total	170	171	341

the Sport Flow Q Sort in the same pattern (approximating a normal distribution), the statement mean score for each athlete's responses is the same, 6.00. However, the range of mean values for statements varied between the potential high of 11.00 "most like me" and the potential low of 1.00 "least like me" extremes of the continuum. For the total sample of 318 athletes, a range of 8.497 to 3.123 is obtained for the Q items. The largest range is obtained for the softball athletes with a high mean score of 9.219 and a low mean value of 2.031. The range from 8.905 to 3.881 for golfers is the smallest reported for any group.

Flow

Flow is the experiential state perceived by all athlete groups as most like them with respect to their collegiate sport experiences. An overall mean score of 7.507 out of a possible 11.00 is obtained for the flow statements. The standard deviation is 0.666. Each flow element is "more like" the collegiate athletes than the other feeling state categories and subcategories of worry and boredom. The order in which the flow elements are interpreted as characterizing the flow experience in sport is as follows: (a) centering of attention, 7.794, (b) control, 7.715, (c) merging of action and awareness, 7.643, (d) autotelic nature, 7.626, (e) clarity, 7.029, and (f) loss of ego, 6.817. Clarity and loss of ego flow qualities consistently attain the lowest mean scores. Flow

experiential state and flow element descriptive data are presented in Table K for the total sample of athletes, in Table L for gender comparisons, and in Table M according to sport affiliations. The latter also denotes gender information for each sport.

Inspection of the statement rank order tables reveals that flow items dominate the top 20 ranked statements of the Sport Flow Q Sort for all respondents. Seventeen of the "most like me" statements for the total sample are flow items. No sport group includes less than 15 flow statements in the highest fourth of the items. Statements 14, 53, and 58 are common to the first ranked 10 statements for all subsamples, and other flow items appearing in all of the highest ranked 20 items are Statements 2, 7, 70, and 72. Six of the eight items specifically depicting a balance of skill and challenge to attain flow are among the seven most descriptive statements. As indicated by standard deviations, greater variability exists for the flow elements than for the broader experiential state categories.

Nonflow

Nonflow items generate the lowest mean, 4.832. With two exceptions, i.e., Statement 16 and the golfers' interpretations of this category, nonflow statements are sorted by the respondents as unlike their sport experiences. The autotelic quality is consistently valued highest, i.e.,

perceived to be like rather than unlike the collegiate athletes' competitive sport experiences.

Worry-Anxiety$_w$

Mean scores for the statements representing worry and anxiety$_w$ are 5.617 and 5.181. The more extreme mismatching of skill and challenge are least descriptive of the sorters. Standard deviations of .844 and .796 are associated with the worry feeling state dimension.

Worry-anxiety$_w$ statements are distributed most evenly throughout the sort. Mean scores for the total sample range from 7.767 for twelfth-ranked Statement 17 to 2.478 for Statement 4 ranked last of the 80 items. Worry items 17 and 20 are common to the "most like me" items for all groups, and Statements 4, 28, 48, and 49 are among the one-fourth least characteristic items for all subgroups.

Boredom-Anxiety$_b$

Boredom-anxiety$_b$ statements yield a mean score of 5.230. Like the worry dimension statements, the anxiety extreme of boredom generates a lower mean than that attributed to worry. The 0.678 standard deviation reported for anxiety$_b$ is less than that of 0.775 obtained for boredom. However, the small difference between the mean scores of 5.211 and 5.179 suggests that the respondents may not differentiate between the boredom subcategories denoting an imbalance in the skill/challenge ratio to

the same degree that they do for the worry-anxiety$_w$ experiential state.

The experiential state referred to as boredom-anxiety$_b$ is least characteristic of the collegiate athletes' self-perceptions of sport participation. No items appear among the 20 highest-ranked statements. The mean of 6.645 assigned to Statement 32 by the football subsample is the highest value obtained for a boredom item. Only Statement 8 is commonly ranked among the 20 least descriptive items for all groups. In general, boredom feeling state items are concentrated in the middle to low ranges of the sort continuum.

Correlation Analysis for Flow Experiential States and Flow Elements

Kendall tau correlation coefficients provide statistical measures by which the degrees of association between flow theory constructs are revealed. Since the data derived from the ranking procedure of the Q sort instrument are ordinal, the nonparametric Kendall tau technique is employed to assess relationships between flow experiential states and flow elements.

The relationships among flow experiential states are reported in Table N. Significance levels are presented with the Kendall tau values for each pair of feeling states. Highly significant negative relationships at the .0001 level exist between all combinations of flow,

worry-anxiety$_W$ and boredom-anxiety$_D$ including their subcategories. The moderate negative Kendall tau values of -.3755 and -.3339 generated between flow and worry-anxiety$_W$ and between flow and worry respectively are the highest correlation coefficients across the feeling state categories. Correlation coefficients of -.3212 between worry-anxiety$_W$ and -.3105 between worry-anxiety$_W$ and boredom are also moderate.

Positive relationships are associated with all correlations calculated within the same experiential state dimension. Each of these Kendall taus is significant at the .001 level. The high correlations between worry-anxiety$_W$ and worry, and between boredom-anxiety$_D$ and boredom reflect the common underlying feeling state and skill/challenge relationship expressed in each category being compared. The relationship between nonflow and flow is negative and significant with a Kendall tau value of -.2548. Other nonflow correlation coefficients are very low and nonsignificant.

Relationships between the flow elements are reported in Table O. All of the Kendall tau values are positive and low. The largest correlation coefficient of .2201 is generated for loss of ego and clarity. Control is the only flow quality not significantly related to any of the other flow elements.

Reliability Analysis

To determine the reliability of the sort, Kendall tau correlation coefficients for test-retest Sport Flow Q Sort data are calculated for the flow experiential states and elements and for each of the 80 items comprising the instrument. The results for the flow experiential states and elements are reported in Table P. The relationships for statements grouped into the flow categories are all positive and statistically significant at the .05 level of confidence. The strength of the correlations are moderate to high.

Kendall tau correlation values for the separate Q sort items range from low to high. Most statements are in the moderate range of association. All of the coefficients are positive, and 63 of the 80 values are significant. Table Q presents the test-retest means and Kendall taus for each of the Q sort statements. Considering the complexity of both the concepts under investigation and the methodology, the sort is interpreted as reliable.

Factor Analysis

The Sport Flow Q Sort responses of 318 athletes are factor analyzed by a principal component method. Varimax, quartimax, and promax rotations are executed to determine whether the emerging patterns offer clearer insights into interpretation of the data.

Twenty-seven factors attaining the eigenvalue criterion of one are retained for further analysis. They account for 64.3% of the proportion of total variance. Table R provides a summary of the factor analysis obtained for the varimax procedure. The following information is reported for each factor: (a) number of statements with a factor loading of $\pm$ .4, (b) range of factor loadings, (c) range of communalities, (d) eigenvalues, and (e) proportion of total variance.

Factor I is comprised of 12 statements and explains 8.5% of the variance. Worry-anxiety$_W$ Statements 3, 9, 23, 24, 37, 38, 41, 46, 50, 61, and 64, including all items specifically referring to flow elements for this feeling state loaded on this factor. Since 11 of 12 statements derived from the worry-anxiety$_W$ experiential state, Factor I gives strong support for Csikszentmihalyi's conceptual framework.

Boredom statements 32, 60, 71, 73, and 76 constitute the statements with .4 or higher loadings on Factor II and account for 6.4% of the variance. This factor also lends credibility to Csikszentmihalyi's theoretical propositions.

The s/c flow Statements 54, 58, and 72 are contained in Factor III. Negative loadings of .4 or higher are obtained for flow Statements 11, 13, 18, and 30 comprising Factor IV. Boredom-anxiety$_D$ Statements 25, 26, and 32

constitute Factor V. Factor VI contains flow Statements 7, 58, and 77. The small number of statements that loaded on these factors and the relatively small contribution to the variance explained by each suggests that the factor structure underlying flow theory begins to break down.

Although the statements loading on each of the six factors explaining the most variance in the data represent broad flow experiential state categories, they account for only 27.8% of the variance. Except for Factor XI which derives positive loadings for worry Statements 28, 48, and 49, and a negative factor loading for flow Statement 58, Factors VII to XXVII are comprised of no more than two items, and eigenvalues do not exceed 2.025. These factors generated by the analysis defy identification. They explain little more of the variance than the individual statements of the Sport Flow Q Sort.

T-Test Gender Comparisons

To make gender comparisons for the Sport Flow Q Sort responses, t-tests are executed for the flow experiential states and flow elements. The finding that no statistically significant differences are generated for any flow category suggests that women and men athletes perceive competitive sport experiences similarly with regard to Csikszentmihalyi's theoretical propositions. The t-test results are reported in Table S.

One-Way Analysis of Variance by Sport

To identify whether significant differences exist among the sort responses of athletes who participate in different collegiate sports, a one-way analysis of variance is computed for each flow experiential state and element category. The ANOVAs are derived from the Sport Flow Q Sort responses of 292 athletes who are affiliated with seven sports, each with a minimum of 20 sorters. Table T shows the summary of F ratios obtained for all of the feeling states. With the exception of the flow, all of the F ratios are significant at the .05 level of confidence. Significant differences are also obtained for the centering of attention and autotelic flow elements.

Additional ANOVAs for the flow theory constructs are performed for responses of 122 women athletes and 141 men athletes. Table U provides the statistics for the following four sports including golf, lacrosse, softball, and tennis having a substantial number* of women respondents. Significant F ratios are generated for the nonflow, anxiety$_w$, boredom, anxiety$_b$, and boredom-anxiety$_b$ feeling states and for the control, clarity, and autotelic flow qualities.

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* The number fell below the accepted criterion of 20 respondents for track and golf. However, the 19 golfers are deemed a sufficient number for the analysis.

Flow category ANOVAs for sort responses of men athletes who compete in baseball, football, golf, lacrosse, and track are reported in Table V. Except for nonflow, all of the experiential state F ratios are significant. Differences among sports for centering of attention, loss of ego, and autotelic nature are also indicated at the .05 level of confidence.

Scheffé

Scheffé tests for all possible comparisons between sport means are performed for the ANOVAs with significant F ratios. Significant Scheffé tests are reported in Table W for all of the athletes, in Table X for women athletes, and in Table Y for men athletes. Means are listed in the tables to indicate the sport group for which the flow categories are more characteristic. Because of the conservative nature of the Scheffé statistic, significant differences are not obtained for all of the flow constructs for which a significant F ratio is reported. The highest Scheffé test is indicated in the tables although the .05 level of confidence is not obtained.

Significant Scheffé tests obtained for the flow constructs are identified. In the within-gender comparison, baseball players consider the flow experience to be more like their sport experiences than do football players. Means of 7.705 and 7.205 are generated for the two subsamples of athletes. No other differences in flow

are found between sport groups. With the aforementioned exception, flow is perceived similarly by collegiate athletes regardless of their sport affiliations.

More sport differences are identified in the worry-anxiety$_w$ experiential state categories. For the total sample, worry is more self-descriptive of the golfers and lacrosse athletes than baseball athletes. Football players report anxiety$_w$ as more like them in their sport involvement than do athletes who compete in lacrosse and tennis. Anxiety$_w$ is less like the tennis players than golf, track, and football athletes. With the exception of anxiety$_w$ for men, all within-gender comparisons generate the same pattern of differences. In general, feelings of worry and anxiety$_w$ are consistently characteristic of the golfers' sport experiences.

All boredom-anxiety$_b$ experiential state categories are perceived to be less like golfers than tennis players for women athletes. For the sample of men, boredom and boredom-anxiety$_b$ are more characteristic of the football players' sport experiences than those of track athletes. Boredom-anxiety$_b$ describes lacrosse players more than track athletes. They also perceive more anxiety$_b$ associated with their sport than do golfers.

In general, feelings of boredom are associated more by football and tennis players than by golf and track

athletes. Football athletes generate the highest means for all boredom categories. Women golfers consistently generate the lowest means for the boredom feeling states.

Football players and golfers perceive the flow elements to be less like themselves in sport than other groups of athletes. For the total sample, football players identify autotelic nature as less like them in sport than softball and lacrosse players. Centering of attention is found to be less like football players than golfers. The flow element mean values for men athletes indicate that autotelic nature is more like track competitors than football players; centering of attention is more associated with baseball athletes compared to football players in their sport experiences; and loss of ego is less like golfers than baseball players. For women athletes, golfers generate higher means for the control quality than do tennis players. Lower means are obtained by golfers for clarity compared to softball players and for autotelic nature relative to the responses of lacrosse players.

Although significant ANOVAs are generated for all of Csikszentmihalyi's feeling state categories and five of the six flow elements, few differences are detected between sport pair comparisons. Athletes generally perceive their experiences in intercollegiate sports more similarly than differently.

CHAPTER V

DISCUSSION

Research findings pertaining to collegiate athletes' responses to the Sport Flow Q Sort are discussed in relation to Csikszentmihalyi's theoretical framework and with consideration of the methods used to generate the data. The discussion is organized into the following seven categories: (a) description of the flow experiential states and flow elements, (b) relationships among the flow theory constructs, (c) reliability of the Sport Flow Q Sort, (d) factor analysis, (e) gender comparisons, (f) sport comparisons, and (g) comparisons between collegiate athletes and high-risk sportspersons.

Flow Experiential States

Flow

Flow is overwhelmingly perceived by the 318 collegiate athletes to be "most like" their experiences in sport. The overall mean of 7.507 is higher than the values obtained for worry-anxiety$_w$, 5.454, and boredom-anxiety$_b$, 5.211. Seventeen of the 20 highest-ranked items represent flow. All of the six flow elements appear in the top-ranked "most like me" items.

Statement 53, "Participating in sport is most enjoyable when a challenging event tests the limits of my

skills," is ranked first among the 80 Q items. It generates a mean of 8.497 out of a possible 11.0. The statement does not specify a particular flow element associated with achieving enjoyment in sport, nor does fourth ranked Statement 7, "The closer my skills match the difficulty of a situation, the more I enjoy my sport." The mean for Statement 7 is 8.198. Other skill/challenge, s/c, flow items for control, autotelic nature, centering of attention, and merging of action and awareness are also among the seven highest-ranked statements. In this study, the essential criterion of balancing skill and challenge to experience enjoyment in sport is clearly substantiated. The essence of achieving flow is confirmed.

Centering of attention. All four centering of attention items are ranked in the 20 "most like me" items. This element yields the highest mean score, 7.794, of the six flow qualities. Statements 45 and 72 are ranked fifth and sixth with the respective means of 8.031 and 7.981. "To feel most satisfied, my sport requires a high pitch of concentration," and "When my skills evenly match a difficult event, I enjoy the feeling of total absorption in my performance," indicate the role of concentration to flow in sport. Thirteenth-ranked Statement 6, "When I am really into my sport, I concentrate so completely that I am not distracted by other things,"

represents a more specific aspect of the centering of attention concept which may account for the mean score of 7.701.

Centering of attention is a prerequisite for the subjectively valued experience of flow in sport as suggested by Csikszentmihalyi (1978b).

> It seems that every time people enjoy what they are doing, or in any way transcend ordinary states of existence, they report specific changes in attentional processes. To be conscious of pleasurable experiences one must narrow the focus of attention exclusively on the stimuli involved. (p. 342)

Control. The salient quality of control in experiencing flow in sport is supported by the 7.715 mean generated for this element. It is perceived as second most descriptive of the athlete respondents. Statement 14, "When my skills are tested by challenges that match my abilities, I enjoy the feeling of being in control of the performance," is ranked second of the 80 Q items. A mean of 8.443 is generated for the s/c statement. The intensity of enjoyment derived from a sense of control is connoted in Statements 67 and 15. They are ranked ninth and 14th. A mean of 7.805 is generated for Statement 67, "Control and self-confidence in my abilities provide a grand expansive feeling in my sport." Statement 15, "I derive a tremendous sense of well-being from having complete control of my world in sport," yields a mean of 7.695.

Merging of action and awareness. A mean score of 7.643 is found for the element denoting the integrated sense of unity and harmony associated with the flow state. Csikszentmihalyi (1975b) considers the merging of action and awareness element the clearest sign of flow. The high rankings of Statements 54, 2, and 70 confirm the strong association of this elusive element in the experience of enjoyment in sport. A mean score of 7.855 is obtained for the seventh ranked s/c flow statement 54, "When my skills equal the demands of a challenging situation, I achieve a sense of oneness in my actions and feelings." Statement 2 yields a mean value of 7.843 and ranks eighth, "I experience a thrill in my sport when my thoughts and actions merge in a momentary sense of unity." For the eleventh-ranked Statement 70, "When I have everything together, my actions are like breathing, automatic and unconscious, I am unaware of them," a mean of 7.767 is found.

Autotelic nature. The intrinsic worth of pursuing sport for its own sake is characteristic of the collegiate athlete respondents. S/c Statement 58 is ranked third of the 80 Q items. "The closer my skills equal a difficult challenge, the more I enjoy performing the movements of my sport," yields a mean score of 8.280 out of a possible 11.0. Tenth-ranked Statement 79, "The pleasure I experience in my movements is enough to compensate

for the time, energy and money invested in my sport," generates a 7.798 mean. The salience of enjoyment compared to external rewards is suggested by both this statement and 16th ranked Statement 59, "In sport, the primary satisfaction for me comes from enjoyment of the experience itself rather than from external rewards such as status, glamour, money, and so forth."

Clarity. Although the mean value of 7.029 for the clarity items is higher than those of the worry and boredom experiential states, only Statement 77 is included in the 20 "most like me" items. "The clear continuous feedback provided in my sport gives me a sense of satisfaction," is ranked 20th. It has a mean of 7.434. Other clarity items are ranked 22nd, 24th, and 32nd among the 80 Q statements.

Of all Csikszentmihalyi's six flow elements, clarity is least associated with a feeling state quality. Knowing what actions to perform and receiving immediate, unambiguous feedback seem more characteristic of the structure of the activity than the sensations of self-confidence related to control and the unity connoted in merging of action and awareness. The writer suggests that the clarity element does not appear to parallel the other flow experiential state qualities. In a recent description of the flow framework, Csikszentmihalyi (1978b) in fact, lists characteristics of the clarity element with structural

considerations of flow activities rather than with the description of the subjective inner feeling state of flow. The data of the present study support such a consideration.

Loss of ego. The collegiate athlete respondents consider loss of ego less descriptive of their sport experience than the other flow elements. A 6.817 mean value is generated for the flow quality. Only 19th ranked Statement 13 is among the "most like me" items. "My sport provides a 'getting away from it all' feeling: I am liberated from the ordinary world," obtains a mean score of 7.443.

Possibly the transcendental nature of loss of ego is difficult to express. Perhaps the very elusive quality of the element is actually experienced less in organized sport than the other qualities attributed to flow. Both explanations could conceivably account for the relatively low rankings of the loss of ego statements.

Nonflow

Nonflow is not a bona fide experiential state in Csikszentmihalyi's theoretical model. Rather, these items are designed into the Sport Flow Q Sort as reverse flow statements. Their purpose is to confirm the sorting of the flow statements; it is conjectured that they would be opposite the flow statements in the sort continuum. The low mean of 4.726 obtained for the six nonflow statements are perceived as anticipated. "Least like me" nonflow

items are ranked 58th, 68th, 74th, 75th, and 76th among the 80 Q statements. Thus, they add to the credibility of flow in sport among collegiate athletes.

The autotelic nonflow item is perceived to be like rather than unlike the athlete respondents with regard to their sport experiences. Statement 16, "I pursue sport for many reasons not primarily concerned with the enjoyment I feel in my movements," is ranked 29th of the 80 Q items. A mean of 6.522 is reported for the statement. The placement of the nonflow autotelic item confirms Csikszentmihalyi's (1975b) contention that "extrinsic and intrinsic rewards need not be in conflict" (p. 22). It is possible and highly likely that the two sources of motivation complement each other. If one acknowledges that motivation is a multifaceted concept, it follows that extrinsic rewards are not achieved at the expense of intrinsic incentives. Since all of the autotelic flow items are ranked higher than Statement 16, the relative worth of intrinsic rewards in sport is evidenced.

Worry-Anxiety$_W$

Worry-anxiety$_W$ statements are most evenly distributed among the 80 Q items. Worry is more like the athlete sorters as indicated by the mean of 5.617 than the anxiety extreme of the experiential state which generated a mean of 5.181. Worry items that specify flow elements

neither appear in the highest or lowest sorted items of this feeling state.

Twelfth-ranked Statement 17 and 15th-ranked Statement 68 generally describe the athlete respondents. Both statements suggest an inverse relationship between improved skill and worry in sport. "As I become more competent, there are fewer situations in which I worry," has a mean of 7.761. Statement 68, "Improved skill tends to eliminate the worry previously produced by challenges beyond my control," generates a mean of 7.695. Worry exists prior to competition, but that too is modified once the event begins. A mean of 7.450 is obtained for eighteenth ranked Statement 20, "I sometimes worry about my abilities to meet the challenges of a situation prior to an event, but that disappears once I get into the activity."

When the collegiate athletes perceive their skills to be exceeded by sport challenges, they seek to adjust the imbalance through active efforts to improve skills. Statement 39, "I make an effort to maintain the pleasure of my sport by developing my skills sufficiently to avoid the anxiety that is associated with too difficult challenges," is ranked 21st. It has a mean of 7.387.

In contrast to growth and skill development, quitting, seeking easier challenges, and limiting

participation are not undertaken to match skills and challenges. This is evidenced by the four lowest ranked Statements, 4, 49, 48, and 28. Anxiety$_w$ Statement 4, "I have considered quitting my sport altogether to eliminate anxiety caused by too challenging an event," yields a mean of 3.123. It is last ranked among the 80 items. The mean of 3.296 is obtained for Statement 49, "I would rather not take part in an event beyond my capabilities than suffer the consequences and anxiety of not being able to handle the situation." Statement 48, "To alleviate the worry I experience in meeting challenges beyond my capabilities, I seek easier tasks," has a mean of 3.497.

Boredom-Anxiety$_b$

The boredom experiential dimension is clearly unlike the sorters' sport experiences. Nine of the 20 "least like me" statements are boredom-anxiety$_b$ items. An overall mean of 5.211 is generated for this feeling state category. Boredom and anxiety$_b$ are perceived similarly.

Anxiety$_b$ Statement 63, "When there is no opportunity to use any of my skills, I become irritated and anxious," is the highest-ranked item of this experiential state. It is ranked 34th and has a mean of 6.075. Considering that the average mean for all 80 Q items is 6.0, Statement 63 cannot be considered generally descriptive of the collegiate athletes.

When skills are superior to challenges, the strategy of creating increased challenges is preferred to nonparticipation to alleviate boredom. Statement 19, "I would rather forego an event than suffer the anxiety that results from conditions far below my expertise," is the lowest-ranked boredom item. It generates a mean of 4.465 and has a rank of 73rd. Statement 56, "To avoid boredom, I restructure my environment to allow me to use more of my skills," has a mean of 6.003. It is ranked 36th. Thus, continued participation is favored to quitting. Creating opportunities for challenge when boredom is experienced and developing skills when worry is encountered both suggest active efforts of the sportspersons to reenter the flow channel.

The data suggest that boredom is not common to active sport participation. Csikszentmihalyi's speculation that boredom feeling states are less likely than either flow or worry in freely chosen endeavors is clearly confirmed.

Relationships Among Flow Experiential States and Flow Elements

Flow is inversely related to nonflow and all categories of the worry and boredom experiential states. All boredom statements are positively related as are those within the worry experiential dimension. Inverse relationships are established for all pairs of worry-boredom

statements. The Kendall tau correlation coefficients are significant. Strengths of the relationships range from moderate to high.

The correlational analysis yields evidence supporting Csikszentmihalyi's conceptualization of the flow theory feeling states. As expected, within category associations for the worry and boredom feeling states are positive. Negative relationships are indicated for categories connoting imbalances in skill/challenge ratios. The congruence between skill and challenge denoted in the flow state is inversely related to ideas of incongruence expressed in worry and boredom. As anticipated, nonflow is negatively related to flow. Nonsignificant relationships between nonflow and the other feeling states is accounted for by the fact that nonflow is not an actual feeling state.

Relationships among the flow elements are lower than those generated for the broader experiential states. Although all Kendall tau values are positive, not all associations are significant. With the exception of control, each of the elements is significantly related to at least one of the other flow qualities. Reference to Csikszentmihalyi's (1975b) description of the flow elements and review of the Q statements representing those qualities do not offer information to readily interpret the pattern of relationships that emerges. High

interdependence among the flow elements as suggested by Csikszentmihalyi is not evidenced in the analysis.

One possible explanation for the low Kendall tau values generated in the analysis is the complex nature of the phenomenon under investigation. The experiential states and elements proposed by Csikszentmihalyi are qualitative abstractions that engender specific meanings. However, there is a high potential for assigning broad arrays of interpretations to the elements defined in the theory. For example, sorters may use various reference points to respond to the control Q items, thus confounding the statistical analysis. Athletes' self-descriptions may differ depending on whether they refer to control in committing oneself to team membership, mastery of skills executed in competitions, or aspects of choice restricted by game and practice schedules and coaches' decisions about who plays when and in what position. Therefore, converting Q data that purportedly measure qualitative constructs to numeric values, and then subjecting them to quantitative analysis may have limitations. Use of strict statistical criteria for interpretation may not be as effective or appropriate as when more objective and concrete phenomena are analyzed. It may be presumptuous to expect precise statistical assessment of qualitative phenomena. The individuality of each athlete's sort and the heterogeneous

nature of the sample may also bear upon the obtained values of the correlation coefficients. These two problems are further discussed later in the chapter.

Reliability

The flow experiential states proposed by Csikszentmihalyi are highly complex and changeable phenomena. Given the idiosyncratic ways events are interpreted, and acknowledging the multitude of factors that influence experiential qualities realized in competition, fluctuations are expected to exist in athletes' perceptions of their sport involvement. Therefore, the positive and moderate to high Kendall tau correlation coefficients generated from test-retest Q data support the reliability of the Sport Flow Q Sort.

Several explanations are offered to explain why the test-retest correlations, particularly for the separate Q statements compared to the experiential state and element statistics, are not higher. It is suggested that the changeable nature of feeling states, the uncertainty associated with sport environments, and the complexity of Q technique confound the problem of determining consistency in the athletes' responses to two administrations of the sort instrument.

Uncertainty is fundamental to sport. Opponents' skills, uncontrollable weather conditions, spectators' responses, officials' judgments, and other chance factors

make outcomes of competition and feelings associated with sport difficult to predict and understandably variable. Further, by virtue of being a team member, college athletes experience sport in various contexts, from practices to critical competitions.

Although the sort directions specifically instruct respondents to arrange the Q statements according to how they "generally perceive" themselves and their experiences in the sport with which they are associated at the time of the sort, recent and/or significant events may color athletes' perceptions of their feelings derived from sport. The immediate impact of a lost tournament bid, a spectacular overtime victory against an archrival, inactivity due to contest postponements, accomplishment of an individual performance goal, or personal concern about a "slump," injury, or upcoming final exam, may override general impressions of one's sport involvement and dominate responses to the Q items.

Csikszentmihalyi (1978a) contends that attention is a limited resource in that persons are capable of focusing on only a fraction of the stimulus cues in the external environment and internal thought processes and memory. Therefore, how attention is allocated to the rich and varied sources of information in sport surroundings determines what athletes experience at any given moment. Shifts in attention conceivably contribute to fluctuations

in athletes' responses to the Q statements in the two- to four-week interim between sort administrations.

The concept of current concerns proposed by Klinger (1978) offers additional support to differences in Q item responses based on attentional processes. Multiple concerns are perceived to persist and impinge upon an individual's perceptions of an activity regardless of what may be going on in the person's consciousness. Therefore, a sportsperson's perceptions of similar sport situations may vary according to the relative dominance of current concerns. For example, apprehension about an opponent's reputation, reservations about a healing injury, or worry related to writing a term paper may persist and influence an athlete's feelings during competition regardless of his or her performance. In such instances, worry may be experienced in situations that are usually interpreted as enjoyable. Of course, paper-and-pencil tests require respondents to reflect upon feelings in classrooms removed from the sport setting. Considering the varied circumstances of the data-gathering process--i.e., immediately after an overtime victory, prior to and after practice sessions, before the first competitions of the season, Klinger's current concerns concept may be a particularly relevant explanation for the differences in two responses to the same Q items.

Neff and Helfand (1963) identify three factors that contribute to low test-retest Q sort reliability correlations. The following are partial explanations for the low and insignificant Kendall tau values obtained for 17 of the 80 Q sort items: (a) unreadable or uninterpretable statements for the sample of collegiate athletes relative to their sport experiences; (b) inadequate representation of the Q items in capturing the essence of the flow experiential states and flow elements; and (c) deficiencies in the proposed theoretical constructs in explaining intrinsic aspects of human behavior.

Since low and insignificant Kendall tau correlation coefficients are generated for five of the nine $anxiety_b$ items, Statements 8, 19, 21, 26 and 74, the feeling state may be unrelated and irrelevant to athletes' perceptions of their sport experiences. The Kendall tau correlation coefficient of .3858 is the lowest value obtained for any of the flow experiential states and elements. Thus, credence is given to Csikszentmihalyi's contention that "active sport participation rules out excessive boredom almost by definition."

Poorly phrased statements are uninterpretable and generate low test-retest correlation coefficients. The low Kendall tau value of .2039 is associated with the double negative contained in $anxiety_w$ Statement 49, "I

would rather not take part in an event than suffer the consequences and anxiety of not being able to handle the situation." Confusion in interpreting the item is evidenced by respondents' questions during the sorting exercise as to whether being anxious meant the statement was like or unlike their participation in sport. The double-meaning of Statement 11, "There is a pleasant feeling of total involvement, getting lost in the action," contributes to the inconsistent ranking of the item. The low Kendall tau value of .1139 suggests that sorters may have focused on either "total involvement" or "getting lost in the action" to sort the item.

Given the elusive nature of flow as an experiential phenomenon, it is likely that the Q statements do not adequately capture its subtle and subjective qualities. Words expressed in the Q format are limited in conveying the intense and dynamic feeling states, perhaps to the point of being inaccurate. For example, the phrases "loss of self-consciousness," "getting away from it all feeling," and "forgetting my hang-ups," do not express the deep, transcendental nature associated with the loss of ego flow element.

According to Csikszentmihalyi, the flow constructs are admittedly tentative. Therefore, the low to moderate reliability of the experiential states and elements as expressed in some of the Q statements may reflect

inadequacies in the conceptual model and/or their semantic representation in self-reference statements about sport.

Factor Analysis

The Sport Flow Q Sort responses of 318 collegiate athletes are analyzed using a varimax rotation of the principal component method. The 27 factors identified from the 80-item sort with a minimum eigenvalue of 1.0 explains 64.8% of the total variance. However, disappointingly, the Q statements are not substantially reduced by such an analysis. Using a factor-loading cutoff of $\pm.4$, only seven distinct factors comprised of three or more underlying Q statements are generated. The interrelated Q items contained in the six factors with the highest eigenvalues correspond to experiential states described in Csikszentmihalyi's flow model. But they account for only 27.8% of the total variance.

The factor analysis of the Sport Flow Q Sort data is undertaken in this study as an exploratory technique, not an inferential one. There is no expectation to achieve high statistically significant results using the procedure. Although the resulting factors contain few Q items and explain a small percentage of the total variance, tney lend support to Csikszentmihalyi's conceptualizations.

Three explanations are offered as to why factor analysis does not simplify and regroup the Q data. The

writer conjectures that the subjective phenomenon under investigation, the methodology used to generate the numerical data, and the nature of the sample contribute to this result.

Q technique is developed to study a phenomenon using a single case of respondents, i.e., a single person or a homogeneous group of persons with known or presumed characteristics relevant to the phenomenon under investigation. In the present study, flow theory constructs related to sport are built into the Q statements. Csikszentmihalyi's conceptualizations are investigated by analysis of collegiate athletes' responses to the 80 items of the Sport Flow Q Sort.

Although all of the respondents are collegiate athletes, diversity characterizes their sport experiences. The sample of respondents includes national champions and highly recruited scholarship athletes as well as first-year competitors and sportspersons with winless seasons. Many of the athletes compete in more than one intercollegiate sport. Variations in breadth and range of experience associated with involvement in different sports may color the respondents' perceptions to the Q statements according to their present team membership. Some respondents refer to their preferred sport whereas others do not. Further, men and women athletes who participate in 10 different sports of all three AIAW, NCAA, and NAIA divisions are included in the sample of athletes.

In effect, the "collegiate athlete" in the study does not constitute a "single case." Variability in the Q responses reflects the diversity of feelings experienced by athletes comprising the sample, and may subsequently influence the integrity of the factor analysis. Greater reduction of the 80 Q items into interpretable factors is considered probable if the Q respondents are more alike. For example, less variability in sport experiences is introduced into Q data obtained from high caliber athletes. The higher skill concept suggests more stable performance and less variability.

The complexity and multivariate nature of the flow experiential states and elements also confound the analysis. The potential for broad arrays of interpretation of the subjective phenomenon under investigation is manifested in the lack of underlying relationships found among the Q statements in the factor analysis. Meaningful interpretation of the highly individualistic flow constructs subjected to group analysis appears to be limited. When data that engender specific qualitative meanings are translated to numbers and treated quantitatively, there is reason to question whether strict statistical criteria for analysis are appropriate.

Factors I through VI are each comprised of statements that represent single flow experiential states. They add

strong support to both Csikszentmihalyi's theoretical constructs and the representation of these in the Q sort statements. Factor I contains 11 items that clearly identify the worry-anxiety$_w$ feeling state. Boredom statements constitute Factor II, and the boredom-anxiety$_b$ feeling state describes Factor V. The flow experiential state is contained in Factors III, IV, and VI. Individual elements do not emerge in the factor analysis. This finding is explained by the greater complexity and more specific nature of the flow elements compared to the more general feeling state categories of worry and boredom.

Inasmuch as self-validating information is potentially generated in exploratory factor analysis (Kim & Mueller, 1978b), Factors I through VI give limited support for the validity of Csikszentmihalyi's experiential states as measured by the Sport Flow Q Sort. Empirical confirmation of the individual flow elements and the anxiety extremes of worry and boredom are not evidenced in the factor analysis.

Gender Comparisons

No statistically significant differences are found in the t-test comparison of men and women collegiate athletes for any of the flow experiential states and elements. It is concluded that men and women experience similar feelings in their sport participation. The

potential to experience flow in active sport involvement is, therefore, equal for all athletes regardless of gender.

The findings permit one to acknowledge with respect to flow in sport, men and women are more similar than different. Qualitative meanings of enjoyment, self-confidence, and fulfillment attributed to sport participation do not appear to be limited by physiological gender-related differences. For example, height, body density, muscular strength, percentage of body fat, and so forth, may impact upon the proficiency of physical performance, but they do not restrict achievement of the flow state in sport. To a large extent, physical differences determine potential quantitative measures; how fast one can swim, how far one can jump, how long one can jog, but not the qualitative dimension of how much one experiences enjoyment in sport.

Although gender differences in the broad experiential state and element categories are not indicated, differences exist in the rankings of the individual Q items. Most notable are those for the autotelic nature statements.

Women athletes rank autotelic nature element Statements 58, 59, and 79 among the five "most like me" items. The same statements are ranked 3rd, 19th and 27th by the men respondents. Both groups acknowledge a greater sensation of enjoyment associated with performing sport

when skills evenly match challenges. Means generated for Statement 58 are 8.426 and 8.142. However, women respondents more readily perceive enjoyment rather than extrinsic rewards as the primary satisfaction derived from sport. Statement 59 yields mean scores of 8.303 for women and 6.779 for men. Statement 79 connoting pleasure as sufficient compensation for investments in sport obtains a mean of 8.297 for women and 7.355 for men.

Csikszentmihalyi (1975b) suggests that individuals vary in the degree to which they experience flow. In his studies, women are found to respond to intrinsic rewards and derive more enjoyment from activities than men do. He attributes the differences to sociocultural factors rather than innate, physiological conditions. The relative rankings of Statements 59 and 79 suggest possible differences between men and women with regard to aspects of the autotelic nature element. As women athletes derive and expect more scholarships, press coverage, and status from their intercollegiate sports participation, these Q items may be perceived even more similarly by both genders.

Sport Comparisons

Although significant ANOVAs are generated for all of Csikszentmihalyi's experiential state categories and five of the six flow elements for the total sample of

athletes, women athletes, and/or men athletes, few differences between sport pairs contribute to the differences. Of the 37 possible comparisons between sport groups only one yields a statistically significant Scheffé test for the flow experiential state. The difference is between baseball players and footoall athletes in the within-gender comparison.

More differences are found for the worry and boredom experiential states and for the individual flow elements. All the differences for women athletes are in golf comparisons. Either football or golf athletes account for 14 of the 15 differences that are obtained for the total sample. However, each sport generates at least one statistically significant Scheffé test.

No clear pattern of differences emerges to provide insights into athletes' sort descriptions when grouped according to sport. In general, it appears that athletes perceive their sport experiences more similarly than differently. Whether this has any direct relationship to the specific nature of the sport or whether it might be explained by other numerous variables is not possible to discern.

Given the diversity characterizing the athletes' experiences, other factors such as length of participation, highest level of performance, and winning seasons may confound identification of factors contributing to sport

differences. The context in which sport exists may have as much or more impact on experiential interpretations as the particular activity in which an athlete participates. Ultimately, as Csikszentmihalyi suggests, individuals' perceptions define feelings associated with sport. Interpretations are not necessarily objective. They are, however, important to the perceiver who derives his or her feelings through active sport participation.

Comparison of Collegiate Athletes and High-Risk Sportspersons

The collegiate athletes' responses to the Sport Flow Q Sort are compared to those of high-risk sportspersons to an early edition of the Q instrument (Progen, 1978). Although the original Q sort contains 60 items and uses a seven-column unforced response format compared to the 80 statements and 11-column forced procedure employed in the present study, a general descriptive assessment of similarities and differences in the sorting patterns is undertaken below.

Flow is overwhelmingly interpreted as "most like" the sport experiences of the collegiate athletes and the sample of stimulus seekers. The worry-anxiety$_w$ experiential state is moderately descriptive of both groups. Boredom-anxiety$_b$ is clearly perceived to be unlike both samples of respondents. Difficulty interpreting the anxiety$_b$

statements and relating them to their sport experiences is reported by both samples of respondents.

High-risk sportspersons and collegiate athletes both initiate active efforts to adjust discrepancies in perceived skill/challenge circumstances to create conditions more conducive to flow. Skill development is used as a means to minimize worry and reenter the flow channel. Restructuring the sport environment by the symbolic creation of additional challenges is characteristic of both groups to alleviate boredom. Quitting and seeking less difficult challenges is uncharacteristic of high-risk sportspersons and collegiate athletes to deal with feelings of either boredom or worry.

The order in which collegiate athletes perceive the flow elements as being descriptive of their sport experiences is as follows: (a) centering of attention, (b) control, (c) merging of action and awareness, (d) autotelic nature, (e) clarity, and (f) loss of ego. This compares to the relative degree of likeness attributed to the elements by high-risk sportspersons: (a) autotelic nature, (b) control, (c) centering of attention, (d) clarity, (e) loss of ego, and (f) merging of action and awareness.

Two notable differences are apparent. First the autotelic nature quality is "most like" the stimulus

seekers, yet listed fourth among the elements for the collegiate athletes. Given the relatively few conventional external rewards associated with parachuting, hang gliding, whitewater canoeing, and the like, compared to the status, scholarships, and media coverage derived from collegiate sport participation, the differences in the rating of this category are understandable. Second, the merging of action and awareness element is ranked last among the six flow elements for the high-risk sorters. This is attributed to a poorly phrased statement representing the element category, which is ranked last among the 60 items of the original sort. Revision of the statement to more accurately reflect the element seems to account for the reported change in the interpretation of the element by the collegiate athletes.

Within the limits of a nonstatistical comparison, the similarities between the responses of high-risk sportspersons and collegiate athletes lend credibility to the generalizability of the Sport Q Sort. Csikszentmihalyi's (1975b) contention that individuals' attitudes and perceptions of the endeavors are more important in experiencing flow than the activities in which they participate is supported. "It is not so much what people do but how they perceive and interpret what they are doing that makes an activity enjoyable" (p. x).

The forced Q format takes approximately twice as long as the open procedure to complete. This is due to the specific distribution of the statements required of the sorters. Increasing the number of items from 60 to 80 and dictating a precise pattern for the arrangement of those items are related to the increased errors in the collegiate athletes' Q responses.

Other factors are assumed to contribute to the relatively large amount of lost information in the second administration of the Q sort. First, more errors tend to occur in data collection sessions involving larger groups. The largest assembly of college athletes is 51 compared to the maximum size of eight high-risk respondents. Although both samples are comprised of volunteers, sessions are arranged by coaches rather than with individual athletes for the intercollegiate teams. Individuals may feel less free to decline participation when volunteered by someone else, especially a person in a position of leadership. In contrast, stimulus-seekers' commitment to the study and their responses to the Q sort are obtained more independently. Further, the sorting exercise is completed more at the respondents' leisure without time pressures of practice schedules, team transportation, and study and class commitments. Decreased error rates are associated with greater individual choices in when and whether to participate in the study. The sample of

stimulus-seekers is comprised of older, more mature sportspersons. Age, nature of the sports, purposes of participation may also contribute to differences in obtained errors.

The valuing of Q sort statements by collegiate athletes generates numerical data that is analyzed so as to describe the sport experience. The obtained results also permit careful examination of flow theory as proposed by Csikszentmihalyi. Gender and sport comparisons as well as comparisons between collegiate athletes and previously studied high-risk sportspersons are made. The viability of flow theory for studying sport is endorsed.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study is to explore Csikszentmihalyi's (1975b) flow theory in sport as perceived by collegiate athletes. The Sport Flow Q Sort developed by Progen (1978) and revised to more comprehensively represent flow theory constructs generates the data. The Q sort contains 80 items and employs a forced format for arranging the items in a normal distribution. Responses of 358 men and women collegiate athletes, collected in the 1980 spring and fall semesters, include members of 39 intercollegiate teams from 22 institutions of higher education. Respondents participate in eleven sports: baseball, basketball, field hockey, football, golf, gymnastics, lacrosse, softball, tennis, track, and volleyball.

Findings indicate that flow is overwhelmingly perceived to be most descriptive of the athletes' sport experiences. Worry-anxiety$_w$ is moderately associated with intercollegiate athletics; feelings of boredom-anxiety$_b$ are not characteristic of their experiences. To alleviate worry, athletes seek skill development to meet challenges rather than participating in easier tasks or quitting. Structuring the environment to create

more challenges is more common than quitting to avoid boredom. The findings are consistent for athletes regardless of sport affiliation or gender.

Each of the six flow elements is more self-descriptive of the athletes than feelings of worry or boredom. The order in which the flow qualities are perceived to be like the respondents is: (a) centering of attention, (b) control, (c) merging of action and awareness, (d) autotelic nature, (e) clarity, and (f) loss of ego. Centering of attention and control are consistently reported to be most like the athletes. Clarity and loss of ego are the elements least like the subjective experiences perceived by the sportspersons.

Significant relationships among the flow experiential states substantiate Csikszentmihalyi's theoretical propositions. Moderate negative Kendall tau correlation coefficients are obtained between flow and the other experiential states and between worry and boredom categories. Within worry and boredom feeling state categories generate positive Kendall tau values. Some positive relationships are found among flow elements. A high degree of interdependence among the flow qualities as suggested by Csikszentmihalyi is not evidenced.

Test-retest data from a subsample of 40 athletes reflect consistency in sort responses. The Sport Flow Q Sort is interpreted as reliable particularly when one

acknowledges the fluctuating nature of feeling states and the complexity of flow theory ideas and Q technique.

Varimax rotation of data does not simplify or reconstitute the 80 Q statements. However, six factors explaining the highest portion of total variance, 27.8%, contain items which represent broad flow theory experiential states. The factor analysis confirms Csikszentmihalyi's feeling states as measured by the Sport Flow Q Sort but not the anxiety extremes of worry and boredom and the flow elements. Translating the highly subjective constructs of flow theory to quantitative values may limit the usefulness of factor analysis.

No gender differences are obtained in the athletes' perceptions of the flow experiential states and elements. It is concluded that men and women experience flow, worry-anxiety$_w$, and boredom-anxiety$_b$ similarly in sport.

Some differences exist in athletes' Q-sort responses when sport affiliation is considered. Significant one-way ANOVAs are obtained for each of the flow experiential states and elements for the total sample, women athletes, and/or men athletes. In general, however, athletes' experiences in intercollegiate sports are more similar than different.

The findings of this investigation confirm Csikszentmihalyi's flow model as descriptive of

intercollegiate athletes' sport experiences. Empirical evidence also supports the reliability of the Sport Flow Q Sort. General similarities in collegiate athletes' Q responses compared to those of high-risk sportspersons and professional women golfers suggest the generalizability of Csikszentmihalyi's theoretical framework in sport.

Conclusions

Within the limitations of the investigation and based upon the data and its analysis, the following conclusions are offered. They are organized as responses to the questions framing the problem statement of the inquiry.

1. How are the experiential states of flow, worry-anxiety$_w$, and boredom-anxiety$_b$ described by collegiate athletes? What are the relationships among the experiential states?

The flow experiential state is overwhelmingly perceived to be most descriptive of the collegiate athletes' sport experiences. Worry-anxiety$_w$ is moderately like the sportspersons' feelings associated with athletic participation. Boredom-anxiety$_b$ is not interpreted as characteristic of the intercollegiate sport experiences. The pattern is consistent for all athletes regardless of gender or sport affiliation.

Negative and highly significant relationships are obtained between flow and both the worry-anxiety$_w$ and

boredom-anxiety$_b$ feeling states. Subcategories within the worry and boredom experiential states are also positively related and significant. Findings support Csikszentmihalyi's theoretical propositions.

2. How are the component elements of the flow experiential state described by collegiate athletes: (a) merging of action and awareness, (b) centering of attention, (c) loss of ego, (d) control, (e) clarity, and (f) autotelic nature? What are the relationships among the flow elements?

Each of the six flow elements is perceived by athletes to be more descriptive of them than the worry-anxiety$_w$ and boredom-anxiety$_b$ experiential state categories. The order in which the flow qualities are perceived to characterize the collegiate athletes' sport experiences is as follows: (a) centering of attention, (b) control, (c) merging of action and awareness, (d) autotelic nature, (e) clarity, and (f) loss of ego. Centering of attention and control are most like the athletes whereas clarity and loss of ego are the flow items least characteristic of sport respondents.

Highly significant positive relationships are found for some pairs of flow elements. High interdependence among the flow elements is not substantiated. The complex, multidimensional nature of the phenomenon and the specific meanings engendered by the elements may explain why a strong pattern of interrelationships among the flow qualities is not established.

3. What is the reliability of the Sport Flow Q Sort?

The 80-item Sport Flow Q Sort is interpreted as reliable based on sort-resort moderate to high correlations.

4. Does factor analysis of the Sport Flow Q Sort suggest new states and elements of the flow experience? Do the resulting factors compare to Csikszentmihalyi's description of the flow theory constructs?

New flow experiential states and elements are not generated by factor analysis. The technique is relatively ineffective in simplifying and/or reducing the Q items. However, the six factors explaining the highest portion of total variance, 27.8%, correspond to Csikszentmihalyi's experiential state categories. These factors support the existence of broad worry, boredom, and flow experiential states. Specific flow elements and the anxiety extremes of worry and boredom experiential states are not confirmed.

5. Are any gender differences or similarities discernible in men and women athletes' interpretations of the flow experiential states and elements?

No gender differences are found for the flow experiential states and elements. Men and women athletes perceive their competitive sport experiences similarly.

6. Do collegiate athletes who compete in different sports perceive Csikszentmihalyi's flow constructs similarly?

Differences across sports are found for each of the flow experiential states and subcategories and for five of the six flow elements. Relatively few between sport

comparisons account for the differences. Most differences are found in worry and boredom experiential states. Regardless of the collegiate athletes' sport affiliations, flow and the feeling states and elements are perceived more similarly than differently by collegiate athletes. The findings confirm Csikszentmihalyi's position that how persons perceive activities is more important than specific structural characteristics of the activity in determining experiential states.

Recommendations

Recommendations for the development and revisions of the Sport Flow Q Sort to more accurately represent flow theory are offered. Further research using the Q instrument to investigate Csikszentmihalyi's proposition in various sport contexts is suggested.

1. Revise the Sport Flow Q Sort. Reduce the size of the instrument to no more than 60 items. Refine ambiguous statements and items that present more than one idea. Use the test-retest data and the factor analysis results as guidelines to revise the Q sort.

2. Compare responses to the Sport Flow Q Sort using both the forced and unforced Q formats. Determine whether statistically significant differences and/or similarities are discernible using the two types of distribution requirements.

3. Conduct a factor analytic study of Sport Flow Q Sort responses obtained from a less variable sample of sportspersons. For example, limit entry into the investigation to one sport and establish strict criteria of commitment to a preferred activity.

4. Administer the Sport Flow Q Sort to multiple-sport athletes to determine how individuals perceive experiences in different sports. Identify factors that contribute to variations in sportspersons' feelings associated with sport.

5. Investigate Csikszentmihalyi's experiential states and element in different sport contexts. More specifically, obtain Sport Flow Q Sort responses from participants of physical education classes. Given that skills are in a state of flux in a learning setting, constant adjustment in challenges are necessary to avoid worry and boredom feeling states. Are flow theory constructs perceived differently in voluntary programs compared to required settings?

6. Conduct an inquiry to determine how sport dropouts perceive the flow experiential states and elements. Boredom is unlike the sport experiences of collegiate athletes, high-risk sportspersons, and professional golfers. Determine whether boredom is characteristic of sport participation in other settings.

7. Compare the Sport Flow Q Sort to other psychological inventories. Identify possible variables contributing to the "autotelic or flow personality." Relate Csikszentmihalyi's flow constructs to motivational concepts.

8. Revise the Sport Flow Q Sort statements to reflect specific performing arts, i.e., music, dance, and drama. Compare sportspersons' experiential perceptions to those of participants in other performing endeavors.

Finally, in order to fully understand and interpret flow as a phenomenon experienced by athletes, perhaps a personalized qualitative strategy could be initiated with the Progen Sport Flow Q Sort, thus achieving in-depth information. Such an approach would permit both elaboration and verification of flow. It would also satisfy the writer's concern about translating a highly subjective qualitative phenomenon to numbers and treating the data quantitatively which may confound the identification of relationships among the flow experiential states and elements.

BIBLIOGRAPHY

Allen, D. J., & Fahey, B. W. Being human in sport. Philadelphia: Lea & Febiger, 1977.

Arlin, M. One-shot publishing typifies educational inquiry. Educational Researcher, 1977 6(9), 11-15.

Barnett, L. A. Play and intrinsic rewards: A reply to Csikszentmihalyi. Journal of Humanistic Psychology, 1976, 16(3), 83-87.

Barr, A. J., Goodnight, J. H., Sall, J. P., & Helweg, J. T. Statistical analysis system. Raleigh, North Carolina: SAS Institute, 1976.

Berlin, P. Motivational dispositions of collegiate women athletes: A tentative theoretical structure. Paper presented at the Conference on Women and Sport, Macomb, Illinois, June, 1973.

Berlyne, D. E. Conflict, arousal and curiosity. New York: McGraw-Hill, 1960.

Berlyne, D. E. Curiosity and exploration. Science, 1966, 153, 25-33.

Block, J. A. Comparison of forced and unforced Q sorting procedures. Educational and Psychological Measurement, 1956, 16, 481-493.

Brown, S. R. Bibliography of Q technique and its methodology. Perceptual and Motor Skills, 1968, 26, 587-615.

Brown, S. R. The forced-free distinction in Q technique. Journal of Educational Measurement, 1971, 8, 283-297.

Brown, S. R. Q bibliographic update: A continuation of "bibliography on Q technique and its methodology." Operant Subjectivity, 1977, 1(1), 17-26.

Brooks, W. D. Q-sort technique. In P. Emmett & W. D. Brooks (Eds.), Methods of research in communication. Boston: Houghton Mifflin, 1970.

Butler, J. M., & Fiske, D. W. Theory and techniques of assessment. Annual Review of Psychology, 1955, 6, 327-356.

Callois, R. Man, play, and games (M. Barash, trans.). New York: Schocken Books, 1979.

Child, D. The essentials of factor analysis. New York: Holt, Rinehart & Winston, 1970.

Cronbach, L. J., & Gleser, G. C. Review of W. Stephenson, The study of behavior. Psychometrika, 1954, 19, 327-330.

Csikszentmihalyi, M. Flow: Studies of enjoyment (PHS Grant Report N. Rol 22883-02). Chicago: University of Chicago, 1974.

Csikszentmihalyi, M. A study of play and intrinsic rewards. Journal of Humanistic Psychology, 1975, 15(3), 41-63. (a)

Csikszentmihalyi, M. Beyond boredom and anxiety. San Francisco: Jossey-Bass, 1975. (b)

Csikszentmihalyi, M. Reply to Barnett. Journal of Humanistic Psychology, 1976, 16(3), 89-91.

Csikszentmihalyi, M. Attention and the holistic approach to behavior. In K. S. Pope & M.L. Singer (Eds.), The stream of consciousness. New York: Plenum Press, 1978. (a)

Csikszentmihalyi, M. Intrinsic rewards and emergent motivation. In M. R. Lepper & D. Greene (Eds.), The hidden costs of rewards. New York: John Wiley & Sons, 1978. (b)

Csikszentmihalyi, M., & Bennett, S. An exploratory model of play. American Anthropologist, 1971, 73(1), 45-58.

De Charms, R. Personal causation. New York: Academic Press, 1968.

Deci, E. L. Intrinsic motivation. New York: Plenum Press, 1975.

Deci, E. L. Application of research on the effects of rewards. In M. R. Lepper & D. Greene (Eds.), The hidden costs of rewards. New York: John Wiley & Sons, 1978. (a)

Deci, E. L. Intrinsic motivation: Theory and application. In D. M. Landers & R. W. Christina (Eds.), Psychology of motor behavior and sport 1977. Champaign, Illinois: Human Kinetics Publishers, 1978. (b)

DeSensi, J. T. A study of Martin Buber's I-thou and I-it relationships in sport. Unpublished doctoral dissertation, University of North Carolina at Greensboro, 1980.

Ellis, M. J. Why people play. Englewood Cliffs, New Jersey: Prentice-Hall, 1973.

Fetters, J. L. Sport, myth and the courage of self-creation. Quest, 1978, 30, 36-45.

Frank, G. H. Note on the reliability of Q-sort data. Psychological Reports, 1956, 2, 182.

Gaito, J. Forced and free Q-sorts. Psychological Reports, 1962, 10(2), 251-254.

Harris, D. V. Perceptions of self. In B. van der Smissen (Ed.), Research camping and environmental education. Proceedings from the National Research Workshop, The Pennsylvania State University, December 3-6, 1975, 153-163

Harris, J. C. Play and enjoyment: Perspectives and implications. Quest, 1978, 29, 60-72.

Harris, J. C. Play: A definition and implied interrelationships with culture and sport. Journal of Sport Psychology, 1980, 2(1), 46-61.

Hess, R. D., & Hink, D. L. A comparison of forced vs. free Q-sorting procedure. Journal of Educational Research, 1959, 53, 83-90.

Huizinga, J. Homo Ludens. Boston: Beacon Press, 1955.

Jones, A. Distribution of traits in current Q-sort methodology. Journal of Abnormal and Social Psychology, 1956, 53, 90-95.

Kerlinger, F. N. The attitude structure of the individual: A Q-study of the educational attitudes of professors and laymen. Genetic Psychology Monographs, 1956, 53, 283-329.

Kerlinger, F. N. Foundations of behavioral research 2nd ed.). New York: Holt, Rinehart, & Winston, 1973.

Kim, J., & Mueller, C. W. Introduction to factor analysis. Beverly Hills: Sage, 1978. (a)

Kim, J., & Mueller, C. W. Factor analysis: Statistical methods and practical issues. Beverly Hills: Sage, 1978.

Kleban, M. H. Q-technique methodology in the study of healthy aged men: Part 1. Experimental Aging Research, 1979, 5(2), 109-135.

Kleinman, S. The significance of human movement: A phenomenological approach. In E. W. Gerber (Ed.), Sport and the body. Philadelphia: Lea & Febiger, 1972.

Klinger, E. Modes of normal conscious flow. In K. S. Pope & J. L. Singer (Eds.), The stream of consciousness. New York: Plenum Press, 1978.

Kroll, W. Current strategies and problems in personality assessment of athletes. In A. C. Fisher (Ed.), Psychology of sport. Palo Alto: Mayfield, 1976.

Laski, M. Ecstasy: A study of some secular and religious experiences. Bloomington: Indiana University Press, 1962.

Lepper, M. R., & Greene, D. The hidden costs of rewards. New York: John Wiley & Sons, 1978.

Livson, N., & Nichols, T. Discrimination and reliability in Q-sort personality descriptions. Journal of Abnormal and Social Psychology, 1956, 52, 159-165.

Mannell, R. C. The "Psychologization" of leisure services. In T. L. Goodale & P. A. Witt (Eds.), Recreation and leisure: Issues in an era of change. University Park, Pennsylvania: Venture Publishing, 1980.

Martens, R. Sport competition anxiety test. Champaign, Illinois: Human Kinetics Publishers, 1978.

Martens, V. The "peak experience" as it relates to sport: A philosophical inquiry. Unpublished master's thesis, University of North Carolina at Greensboro, 1978.

Maslow, A. H. Religions, values, and peak-experiences. Columbus: Ohio State University, 1964.

Maslow, A. H. Toward a psychology of being (2nd ed.). Princeton, New Jersey: D. Van Nostrand, 1968.

Maslow, A. H. Motivation and personality (2nd ed.). New York: Harper & Row, 1970.

McGirr, M. B. Women professional and amateur golfers' self-perceptions with respect to flow theory. Unpublished master's thesis, University of North Carolina at Greensboro, 1979.

Michaelis, W. Fantasy, play, creativity and mental health. In T. L. Goodale & P. A. Witt (Eds.), Recreation and leisure: Issues in an era of change. State College, Pennsylvania: Venture Publishing, 1980.

Miller, S. Ends, means and galumphing: Some leitmotifs of play. American Anthropologist, 1973, 75(1), 87-98.

Murphy, M. Sport as yoga. Journal of Humanistic Psychology, 1977, 17, 21-33.

Neff, W. S., & Cohen, J. A method for the analysis of the structure and internal consistence of Q-sort arrays. Psychological Bulletin, 1967, 68(3), 361-368..

Neff, W. S., & Helfand, A. A Q-sort instrument to assess the meaning of work. Journal of Counseling Psychology, 1963, 10, 139-145.

Nunnally, J. C. Psychometric theory (2nd ed.). New York: McGraw-Hill, 1978.

Park, R. Raising the consciousness of sport. Quest, 1973, 19, 78-82.

Progen, J. L. A description of stimulus seeking in sport according to flow theory. Unpublished master's thesis, University of North Carolina at Greensboro, 1978.

Progen, J. The potential of flow theory for studying meaning in physical education. Paper presented at the Ninth Annual Southern Association of Physical Education for College Women Conference, Jekyll Island, Georgia, October 26, 1979.

Ravizza, K. H. A study of the peak-experience in sport (Doctoral dissertation, University of Southern California, 1973). Dissertation Abstracts International, 1973-1974, 34, 3965A. (University Microfilms No. 74-941, 206)

Ravizza, K. Peak experiences in sport. Journal of Humanistic Psychology, 1977, 17, 35-40.

Rinn, J. L. A methodology: An application to group phenomena. Educational Measurement, 1961, 21, 315-329.

Roscoe, J. T. Fundamental research statistics for the behavioral sciences (2nd ed.). New York: Holt, Rinehart & Winston, 1975.

Rummel, R. J. Applied factor analysis. Evanston, Illinois: Northwestern University Press, 1970.

Stephenson, W. The study of behavior. Chicago: University of Chicago Press, 1953.

Stephenson, W. Perspectives in psychology: Consciousness out--subjectivity in. Psychological Record, 1968, 18, 499-501.

Stevens, P., Jr. Play and work: A false dichotomy. In H. B. Schwartzman (Ed.), Play and culture. West Point, New York: Leisure Press, 1980.

Thomas, C. The perfect moment: An authentic perception of the sport experience. Unpublished doctoral dissertation, Ohio State University, 1972.

Thomas, C. E. Science and philosophy: Peaceful coexistence. Quest, 1973, 20, 99-104.

White, R. W. Motivation reconsidered: The concept of competence. Psychological Review, 1959, 66, 297-333.

Wittenborn, J. Contributions and current status of Q-methodology. Psychological Bulletin, 1961, 58, 132-142.

APPENDIX A

DATA COLLECTION AND ORGANIZATION MATERIALS

Sport Flow Q Sort Statements

Flow Category		Statement
Flow merga+a	1.	I experience more joy and satisfaction while I am actively engaged in my sport than in thinking about past events or future performances.
Flow merga+a	2.	I experience a thrill in my sport when my thoughts and actions merge in a momentary sense of unity.
Worry lossego	3.	When my skills are tested beyond their limits, worry causes me to become self-conscious about my performance.
$Anxiety_w$	4.	I have considered quitting my sport altogether to eliminate the anxiety caused by too challenging an event.
Boredom	5.	When I misjudge the skill required for a task and it is <u>not</u> up to par with my expertise, the experience is boring.
Flow centatt	6.	When I am really into my sport, I concentrate so completely that I am <u>not</u> distracted by other things.
Flow s/c general	7.	The closer my skills match the difficulty of a situation, the more I enjoy my sport.
$Anxiety_b$	8.	As my skills completely outweigh a challenge, my boredom increases to a point of anxiety.
Worry	9.	Challenges in my sport rarely cause me to worry.
$Anxiety_b$	10.	By creating my own "rules" and/or "handicapping" myself, I have added enough challenge to my environment to change a tediously anxious situation to one that is fun.

Flow Category		Statement
Flow centatt	11.	There is a pleasant feeling of total involvement, getting lost in the action.
$Anxiety_w$	12.	The anxiety caused by engaging in a situation beyond my mental and physical skills decreases as I seek less demanding challenges.
Flow lossego	13.	My sport provides a "getting away from it all" feeling; I am liberated from the ordinary world.
Flow s/c control	14.	When my skills are tested by challenges that match my abilities, I enjoy the feeling of being in control of the performance.
Flow control	15.	I derive a tremendous sense of well-being from having complete control of my world in sport.
Nonflow autotelic	16.	I pursue my sport for many reasons <u>not</u> primarily concerned with the enjoyment I feel in my movements.
Worry	17.	As I become more competent, there are fewer situations in which I worry.
Flow lossego	18.	I forget my "hang-ups" and get lost in the action.
$Anxiety_b$	19.	I would rather forego an event than suffer the anxiety that results from conditions far below my expertise.
Worry	20.	I sometimes worry about my abilities to meet the challenges of a situation prior to an event, but that disappears once I get into the activity.
$Anxiety_b$	21.	I rarely engage in an undertaking so tedious and dull that it causes me to be anxious.
Flow control	22.	Part of the thrill of my sport comes from mastering myself and the environment by minimizing the risks and uncertainties.

Flow Category	Statement
Worry autotelic	23. When confronted by challenges beyond my capabilities, worry interferes with my enjoyment of doing the skills.
Worry	24. When I participate with others who have more skill and experience than me, I worry about my performance.
Boredom autotelic	25. When my skills outweigh the challenges of sport, I become bored and lose pleasure in performing the movements.
$Anxiety_b$	26. I experience restlessness and anxiety in my sport when the challenges I face are far below my capabilities.
Nonflow centatt	27. I am rarely absorbed in the flow of my movements.
Worry	28. I limit my sport participation rather than worry about the consequences of situations that are too difficult for me to handle.
$Anxiety_w$	29. When I get into an event that is too difficult for my experience, the thrill and exhilaration change to sheer anxiety.
Flow clarity	30. In sport, the confusion of daily life is filtered out and I can act with a clarity of purpose.
$Anxiety_w$	31. There are times when the anticipation of an event causes me to lose sleep.
Boredom	32. Situations that do <u>not</u> have a constant variety of challenges to test my skills are boring.
Boredom	33. It bores me to participate with others who do <u>not</u> match my skill and expertise.
Flow autotelic	34. My sport needs no other justification than my pursuing it.
$Anxiety_b$	35. Repeating the same old routine with no opportunity to test my skills is so boring that it makes me anxious.

Flow Category		Statement
Boredom clarity	36.	When an event is too routine to challenge my skills, my decisions are so obvious that I become bored.
Worry control	37.	When a difficult event exceeds my abilities, worry interferes with my sense of control of the performance
$Anxiety_w$	38.	Sometimes I worry about coping with the demands of my sport to the extent that it leads to anxiety.
$Anxiety_w$	39.	I make an effort to maintain the pleasure of my sport by developing my skills sufficiently to avoid the anxiety that is associated with too difficult challenges.
Flow lossego	40.	When my skills equal a difficult challenge, I experience a "loss of self-consciousness" that enables me to enjoy my sport.
$Anxiety_w$	41.	No challenge is so great that I feel anxious and uptight about it.
Boredom merga+a	42.	When my abilities are unchallenged by an event, I become bored and just go through the motions of performing the skill.
$Anxiety_b$	43.	When a situation is misclassified by over-rating its difficulty, I feel frustrated and anxious about <u>not</u> having opportunities to exercise my skills.
Boredom	44.	As I have increased my skill, situations that were once challenging and exciting are now boring.
Flow centatt	45.	To feel most satisfied, my sport requires a high pitch of concentration.
Worry merga+a	46.	When the challenges of a situation exceed my skill, worry tends to make my movements mechanical and deliberate rather than natural and flowing.

Flow Category		Statement
Boredom control	47.	When my abilities exceed the difficulty of an event, I experience boredom in not being able to control the pace of the action.
Worry	48.	To alleviate the worry I experience in meeting challenges beyond my capabilities, I seek easier tasks.
$Anxiety_w$	49.	I would rather not take part in an event beyond my capabilities than suffer the consequences and anxiety of not being able to handle the situation.
Worry	50.	I worry when confronted by excessive challenges.
Nonflow merga+a	51.	The past and the future absorb me and my thoughts rarely focus on the here and now of my actions.
$Anxiety_w$	52.	Facing overwhelming challenges makes me anxious.
Flow general	53.	Participating in sport is most enjoyable when a challenging event tests the limits of my skills.
Flow s/c merga+a	54.	When my skills equal the demands of a challenging situation, I achieve a sense of oneness in my actions and feelings.
Boredom	55.	I only engage in events that are technical enough to challenge my skill so that my sport does not become dull.
Boredom	56.	To avoid boredom, I restructure my environment to allow me to use more of my skills.
Boredom centatt	57.	When the demands of an event are below my skill level, I tend to lose interest and have difficulty keeping my attention on the task.
Flow s/c autotelic	58.	The closer my skills equal a difficult challenge, the more I enjoy performing the movements of my sport.

Flow Category		Statement
Flow autotelic	59.	In sport, the primary satisfaction for me comes from enjoyment of the experience itself rather than from external rewards such as status, glamour, money, and so forth.
Boredom	60.	No task is so routine that it bores me.
Worry clarity	61.	When my skills are inadequate for a difficult event, worry makes me unsure of the "right" skill to perform.
Nonflow lossego	62.	I rarely lose myself in the activity to the extent that time seems to pass much faster than it actually does.
Anxiety$_b$	63.	When there is no opportunity to use any of my skills, I become irritated and anxious.
Worry centatt	64.	When a difficult challenge requires talents beyond my skills, worry tends to interfere with my concentration.
Nonflow control	65.	Seldom do I experience the thrill and satisfaction of having total control in my sport.
Worry	66.	When I underestimate the risk involved in a situation that is over my head, I experience worry rather than enjoyment.
Flow control	67.	Control and self-confidence in my abilities provide a grand expansive feeling in my sport.
Worry	68.	Improved skill tends to eliminate the worry previously produced by challenges beyond my capabilities.
Nonflow clarity	69.	In sport, I must question and judge my every action, what I must do next is <u>not</u> usually automatic.
Flow merga+a	70.	When I have everything together, my actions are like breathing, automatic and unconscious, I am unaware of them.

Flow Category		Statement
Boredom	71.	Unless I seek increased challenges, I get bored.
Flow s/c centatt	72.	When my skills evenly match a difficult event, I enjoy the feeling of total absorption in my performance.
Boredom lossego	73.	When the demands of sport do not test my skills, boredom interferes with my ability to get lost in the action.
Anxiety$_b$	74.	I get anxious when the outcome of an event is so obvious that the uncertainty in my sport is limited.
Flow clarity	75.	Unlike the ordinary world, in sport I immediately know the results of my actions and what I must do next.
Boredom	76.	I tend to become bored when faced by unchallenging situations.
Flow clarity	77.	The clear continuous feedback provided in my sport gives me a sense of satisfaction.
Flow lossego	78.	I do not feel self-conscious when I am doing my thing in sport, I just float along and have fun.
Flow autotelic	79.	The pleasure I experience in my movements is enough to compensate for the time, energy and money invested in my sport.
Flow s/c clarity	80.	When my abilities match the challenges of a difficult situation, my decisions for action are clear and automatic.

Sport Flow Q Sort Statements Organized by Category

Flow Element	Flow General	Flow S/C	Nonflow	Worry	Boredom
Merga+a	01, 02, 70	54	51	46	42
Centatt	06, 11, 45	72	27	64	57
Lossego	13, 18, 78	40	62	03	73
Control	15, 22, 67	14	65	37	47
Clarity	30, 75, 77	80	69	61	36
Autotelic	34, 59, 79	58	16	23	25
General		07, 53			

Experiential State	
Flow	01, 02, 06, 07, 11, 13, 14, 15, 18, 22, 30, 34, 40, 45, 53, 54, 58, 59, 67, 70, 72, 75, 77, 78, 79, 80
Nonflow	16, 27, 51, 62, 65, 69
Worry	03, 09, 17, 20, 23, 24, 28, 37, 46, 48, 50, 61, 64, 66, 68
$Anxiety_w$	04, 12, 29, 31, 38, 39, 41, 49, 52
Worry-$Anxiety_w$	03, 04, 09, 12, 17, 20, 23, 24, 28, 29, 31, 37, 38, 39, 41, 46, 48, 49, 50, 52, 61, 64, 66, 68
Boredom	05, 25, 32, 33, 36, 42, 44, 47, 55, 56, 57, 60, 71, 73, 76
$Anxiety_b$	08, 10, 19, 21, 26, 35, 43, 63, 74
Boredom-$Anxiety_b$	05, 08, 10, 19, 21, 25, 26, 32, 33, 35, 36, 42 43, 44, 47, 55, 57, 60, 63, 71, 73, 74, 76

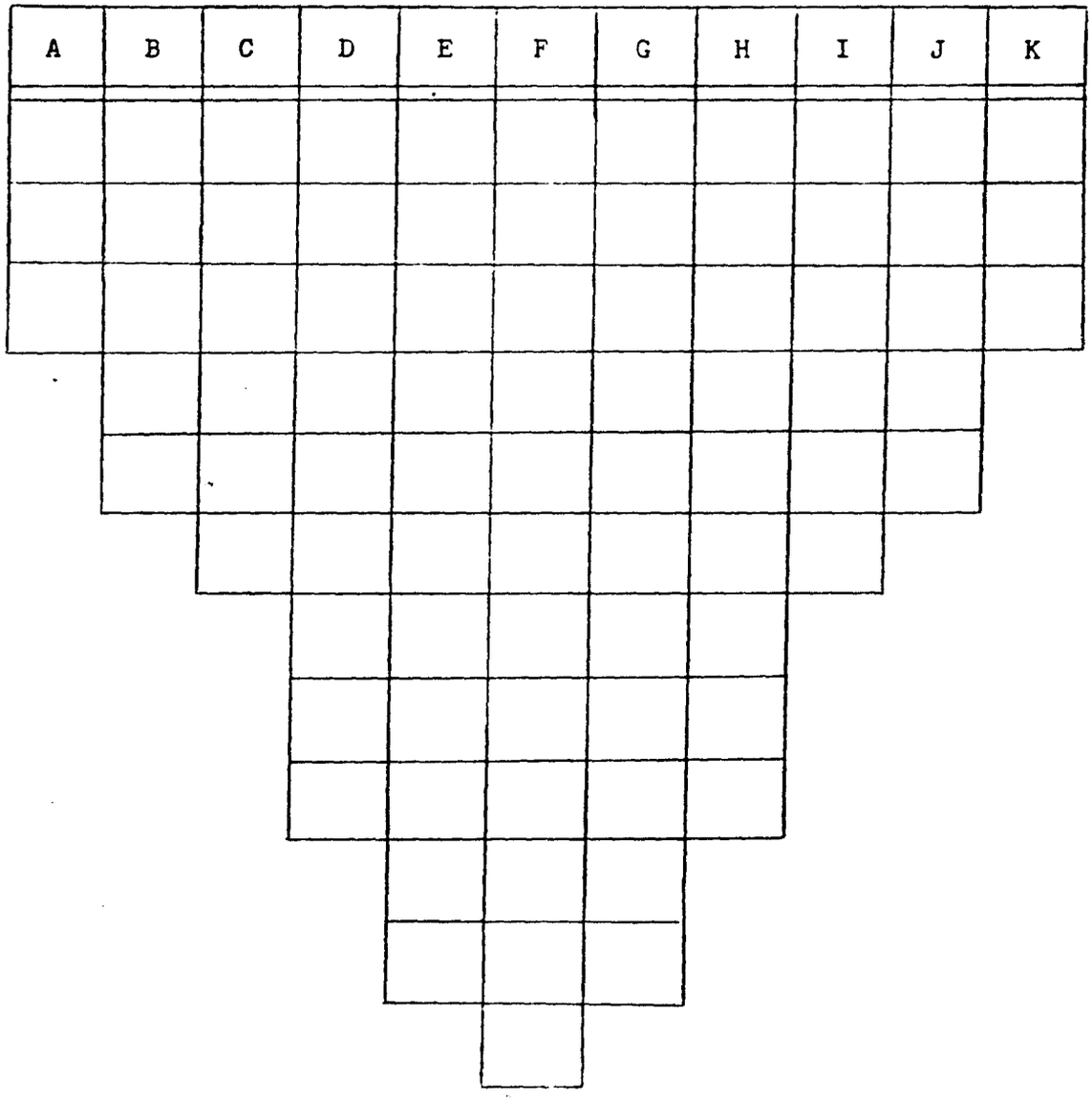
53. Participating in sport is most enjoyable when a challenging event tests the limits of my skills.

68. Improved skill tends to eliminate the worry previously produced by challenges beyond my capabilities.

RESPONSE SHEET

Code Name _____

MOST LIKE ME LEAST LIKE ME



Sort Directions*

You have a set of 80 cards, a diagram of boxes and a pencil. On each card is a statement describing a feeling you may experience in sport. Your task is to sort these statements according to how each one describes you as you generally perceive yourself and your experience in _____. In other words, you are to arrange the 80 statements by placing the number representing those you consider to be most like you at the left end of the diagram and those that are least like you at the right. The remaining fall somewhere between.

The sort diagram contains 80 boxes and is organized in 11 columns. In the extreme left column, A, record the numbers of the three statements that are most like you in your sport; in Column B, record the five numbers of statements that are next like you, and so forth. In Column K, you will record the numbers of the three statements that are least like you; in Column J, next least like you, and so forth.

You must record a statement number in each of the 80 boxes. Be careful not to record the same number more than one time.

There is no time limit. You are encouraged to take as much time as you like to make a thoughtful response. There are no "right" or "wrong" or "best" answers. When you finish, the arrangement of statements will represent your perceptions of your own sport experience.

There is no special way to go about the sorting exercise. One suggested procedure is to read each statement and decide whether it is like you or not. Place "like me" cards on the left; "not like me" cards on the right; and undecided cards in the middle. Then locate the three cards from the left stack that most describe you in your sport and set them aside. Continue through the stack and set aside the five cards that are next like you to be placed in Column B. Then change to the "least like me" cards and locate the three that are to be represented in Column K. Set them aside and find the five cards that are next least like you. Go through the undecided cards and place them to the left or right after a "second thought." Continue the process from each end of the response sheet until the sorting is completed in the middle. When you are certain about the arrangement, record the statement numbers in the appropriate boxes of the diagram.

---

* Prepared on 11 x 14 (legal size) paper, double-spaced for use in the data collection.

QUESTIONNAIRE

Name_____

Choose a fictitious name. Whatever name you select for the questionnaire must "match" the one you use for the response sheet of the sorting task.

1. Sex_____

2. Age_____

3. College/University_____

4. Sport_____

Answer the following questionnaire items 5-9 according to the sport indicated above.

5. Position/Event (if applicable)_____

6. Number of years of participation_____

7. Highest level of participation_____

8. Is this your preferred sport?_____

9. If no, what is your preferred sport?_____

THE UNIVERSITY OF NORTH CAROLINA AT GREENSBORO
SCHOOL OF HEALTH, PHYSICAL EDUCATION & RECREATION

SCHOOL REVIEW COMMITTEE

INFORMED CONSENT FORM

I understand that the purpose of this study is to investigate why collegiate sport participation is enjoyable and satisfying.

I confirm that my participation is entirely voluntary. No coercion of any kind has been used to obtain my cooperation.

I understand that I may withdraw my consent and terminate my participation at any time during the project.

I have been informed of the procedures that will be used in the project and understand what will be required of me as a subject.

I understand that all of my responses, written/oral/task, will remain completely anonymous.

I understand that a summary of the results of the project will be made available to me at the completion of the study if it is so requested.

I wish to give my voluntary cooperation as a participant.

_____
Signature

_____
Address

_____

_____
Date

NUMERICAL CONVERSION SHEET

Sp _____
Sex _____
Age _____
C/U _____
#Yr _____
HL _____
Prf _____
PSp _____

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Q02 _____
Q03 _____
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Q76 _____
Q77 _____
Q78 _____
Q79 _____
Q80 _____

APPENDIX B

CORRESPONDENCE

911-B West Bessemer Avenue
Greensboro, North Carolina 27408
8 March 1980

Dear

I am a doctoral candidate at the University of North Carolina at Greensboro completing a degree in physical education. For my dissertation research, I am conducting a study which explores why sport participation is satisfying and enjoyable. In particular, I am interested in the motivations of collegiate athletes to engage in competitive sports and the enjoyment they derive from their participation in athletics.

The purpose of this letter is to solicit your cooperation in the project by inviting your athletes to participate in the study. I would like to arrange a time to meet with your team. Participation in the project involves the sorting of a number of self-reference statements and the completion of a very brief questionnaire. The sorting exercise requires approximately 45 minutes. I will travel to your campus to administer the inventory at a time convenient to you and the athletes.

Participation in the study is entirely voluntary. The conduct of the investigation complies with the ethical standards of human subject research, and the procedures meet the approval of the School Review Committee of the UNC-G School of Health, Physical Education & Recreation. I have written to your athletic director to offer information about the purposes of the study and to indicate my request for your athletes to participate in the project.

A tentative data collection schedule between March 15 and May 15, 1980, is now being arranged. A large sample of approximately 320 men and women athletes is needed for the project. Every effort is being made to comprise a sample that represents the variety of sports that exists in intercollegiate athletics, including basketball, baseball, football, golf, gymnastics, lacrosse, softball, tennis, and volleyball. The participation of your athletes will contribute to the quality of the research.

Please use the enclosed postcard to indicate whether or not you are willing to arrange a time for me to meet with your team. Perhaps you could suggest a time and dates that would be best for you. Information about dates that your team is unavailable will also help in coordinating the travel for a testing schedule. I will follow-up your response with a letter and/or a telephone call to confirm a session and to answer any questions you may have.

Thank you for your time and consideration.

Sincerely,

Jan Progen

911-B West Bessemer Avenue
Greensboro, North Carolina 27408
12 March 1980

Dear

I am a doctoral candidate at the University of North Carolina at Greensboro completing a degree in physical education. For my dissertation research, I am conducting a study which explores why sport participation is satisfying and enjoyable. In particular, I am interested in the motivations of collegiate athletes to engage in competitive sports and the enjoyment they derive from their participation in athletics.

The purpose of this letter is to inform you that I have contacted coaches at your institution to invite the athletes of their teams to participate in the study. Participation in the project involves approximately 45 minutes to sort a number of self-reference statements and to complete a very brief questionnaire. I will travel to the North Carolina and Virginia campuses of those who agree to take part in the study and administer the inventory.

A tentative data collection schedule between March 15 and May 15, 1980 is now being arranged. A large sample of men and women athletes is being comprised that is representative of the variety of sports that exists in intercollegiate athletics, including, basketball, baseball, football, golf, gymnastics, softball, tennis and track.

Athletes' participation in the study is entirely voluntary. The procedures used in the investigation comply with the ethical standards of human subject research and meet the approval of the UNC-G School Review Committee of the School of Health, Physical Education & Recreation.

Thank you for your time and consideration. I will be happy to answer any questions you have about the inquiry. Your cooperation in the project will contribute to the quality of the research.

Sincerely,

Jan Progen

Please check one:

☐ YES, it is possible to arrange a meeting time for the team to participate in the study.

☐ NO, it is not possible for our athletes to take part in the study.

Comments:

APPENDIX C

DATA CODE PLAN

Data Code Plan

Fortran Coding Form

Line 1: Column

1-3 = Subject identification number

4-7 = Date of data collection

8-9 = Sport

- 01 Baseball
- 02 Basketball
- 03 Football
- 04 Golf
- 05 Gymnastics
- 06 Lacrosse
- 07 Softball
- 08 Tennis
- 09 Track
- 10 Volleyball
- 11 Field Hockey

10 = Sex

- 1 Female
- 2 Male

11-12 = Age

13-14 = College/University

- 01 Averett
- 02 Campbell
- 03 Catawba
- 04 Central Michigan
- 05 Duke
- 06 Elon
- 07 Greensboro
- 08 Guilford
- 09 High Point
- 10 Longwood
- 11 Lynchburg
- 12 N. C. A & T
- 13 N. C. State
- 14 Roanoke
- 15 Ohio State
- 16 Southern Illinois
- 17 U. N. C.-Chapel Hill
- 18 U. N. C.-Greensboro
- 19 U. Tennessee-Knoxville
- 20 Wake Forest
- 21 Washington & Lee
- 22 Appalachian State

15-16 = Number years of participation

17 = Highest level of participation
- 1 National
- 2 Regional
- 3 State
- 4 Collegiate varsity
- 5 Collegiate junior varsity

18 = Preferred sport
- 1 Yes
- 2 No

19-20 = Preferred sport
- 01-11 (as indicated under Sport)
- 12 Soccer
- 13 Swimming
- 14 Wrestling
- 15 Racquetball
- 16 Scuba Diving
- 17 Skiing
- 18 Sailing
- 19 Water skiing
- 20 Cliff Diving

21 = Athletic Division
- 1 AIAW I
- 2 AIAW II
- 3 AIAW III
- 4 NCAA I
- 5 NCAA II
- 6 NCAA III
- 7 NAIA I
- 8 NAIA II
- 9 NAIA III
- 0 NAIA

22 = Size of School
- 1 Under 1000
- 2 5000-4999
- 3 5000-9999
- 4 10000-14999
- 5 15000-19999
- 6 20000-24999
- 7 25000 and over

23-24 = Season percentage of wins

Line 2: Column
1-80 = Values for Q Statements 1-40

Line 3: Column
1-80 = Values for Q Statements 41-80

APPENDIX D

TABLED DATA AND SUMMARIES OF ANALYSES

Table A

Descriptive Sport Flow Q Sort Data

for All Collegiate Athletes

Statement	Rank	Mean	S.D.	Category
53	1	8.497	1.845	F general s/c
14	2	8.443	1.737	F control s/c
58	3	8.280	1.577	F autotlc s/c
7	4	8.198	1.933	F general s/c
45	5	8.031	2.192	F centatt
72	6	7.981	1.790	F centatt s/c
54	7	7.855	1.855	F merga+a s/c
2	8	7.843	2.238	F merga+a
67	9	7.805	2.175	F control
79	10	7.789	2.472	F autotlc
70	11	7.767	2.311	F merga+a
17	12	7.761	2.039	Worry
6	13	7.701	2.447	F centatt
15	14	7.695	2.125	F control
68	15	7.597	1.855	Worry
59	16	7.528	2.521	F autotlc
11	17	7.462	2.225	F centatt
20	18	7.450	2.300	Worry
13	19	7.443	2.497	F lossego
77	20	7.434	2.206	F clarity
39	21	7.387	1.866	$Anxiety_W$
80	22	7.267	2.170	F clarity s/c
1	23	7.107	2.171	F merga+a
30	24	7.069	2.216	F clarity
22	25	6.918	2.175	F control
34	26	6.906	2.513	F autotlc
40	27	6.755	2.123	F lossego s/c
18	28	6.550	2.232	F lossego
16	29	6.522	2.388	NF autotlc
78	30	6.519	2.639	F lossego
31	31	6.409	2.761	$Anxiety_W$
75	32	6.346	2.258	F clarity
52	33	6.129	2.139	$Anxiety_W$
63	34	6.075	2.142	$Anxiety_D$
24	35	6.031	2.670	Worry
56	36	6.003	1.967	Boredom
3	37	5.852	2.555	Worry lossego
32	38	5.698	1.983	Boredom
71	39	5.676	2.089	Boredom
9	40	5.475	2.685	Worry

Table A (Continued)

Statement	Rank	Mean	S. D.	Category
46	41	5.472	2.151	Worry autotlc
38	42.5	5.459	2.153	Anxiety$_w$
76	42.5	5.459	2.096	Boredom
57	44	5.428	1.955	Boredom centatt
23	45	5.409	2.254	Worry autotlc
60	46	5.399	2.611	Boredom
43	47	5.384	1.811	Anxiety$_b$
10	48	5.381	2.246	Anxiety$_b$
21	49	5.352	1.865	Anxiety$_b$
37	50	5.333	2.087	Worry control
64	51	5.289	2.242	Worry centatt
42	52	5.286	2.064	Boredom merga+a
61	53	5.264	1.864	Worry clarity
66	54	5.252	1.816	Worry
73	55	5.233	1.812	Boredom lossego
35	56	5.226	2.037	Anxiety$_b$
36	57	5.217	1.713	Boredom clarity
69	58	5.204	2.453	NF clarity
74	59	5.179	1.743	Anxiety$_b$
50	60	5.091	2.241	Worry
12	61	5.063	1.964	Anxiety$_w$
33	62	5.053	2.213	Boredom
26	63	4.972	1.923	Anxiety$_b$
41	64	4.937	2.537	Anxiety$_w$
47	65	4.912	1.703	Boredom control
44	66	4.906	1.985	Boredom
55	67	4.833	1.890	Boredom
65	68	4.733	2.478	NF control
25	69	4.723	1.837	Boredom autotlc
5	70.5	4.626	1.913	Boredom
29	70.5	4.626	2.061	Anxiety$_w$
8	72	4.572	1.891	Anxiety$_b$
19	73	4.465	2.099	Anxiety$_b$
62	74	4.431	2.197	NF lossego
27	75	4.057	2.078	NF centatt
51	76	4.047	2.019	NF merga+a
28	77	3.689	1.994	Worry
49	78	3.497	2.003	Anxiety$_w$
48	79	3.296	1.907	Worry
4	80	3.123	2.478	Anxiety$_w$

N = 318

Note. F = flow, NF = nonflow, merga+a = merging of action and awareness, centatt = centering of attention, lossego = loss of ego, autotlc = autotelic nature, and s/c = skill/challenge.

Table B

Descriptive Sport Flow Q Sort Data

for Women Athletes

Statement	Rank	Mean	S. D.	Category
4	1	8.595	1.542	F control s/c
53	2	8.453	1.914	F general
58	3	8.426	1.443	F autotlc s/c
59	4	8.365	2.307	F autotlc
79	5	8.297	2.357	F autotlc
7	6	8.264	1.735	F general
72	7	8.088	1.653	F centatt s/c
45	8	8.034	2.168	F centatt
54	9	7.980	1.740	F merga+a s/c
67	10	7.959	2.261	F control
2	11	7.926	2.090	F merga+a
68	12	7.878	1.662	Worry
17	13	7.777	1.972	Worry
15	14	7.736	2.149	F control
77	15	7.662	2.137	F clarity
20	16	7.588	2.163	Worry
11	17	7.554	2.120	F centatt
39	18	7.432	1.903	Anxiety$_w$
70	19	7.385	2.331	F merga+a
6	20.5	7.358	2.542	F centatt
13	20.5	7.358	2.550	F lossego
80	22	7.061	2.120	F clarity s/c
30	23	7.054	2.291	F clarity
1	24	6.980	2.257	F merga+a
40	25	6.932	2.108	F lossego s/c
22	26	6.905	2.146	F control
34	27	6.669	2.671	F autotlc
16	28	6.574	2.405	NF autotlc
24	29	6.473	2.658	Worry
18	30	6.324	2.214	F lossego
3	31	6.264	2.478	Worry lossego
52	32	6.250	1.985	Anxiety$_w$
78	33	6.230	2.718	F lossego
56	34	6.108	1.899	Boredom
31	35	5.946	2.918	Anxiety$_w$
23	36	5.932	2.314	Worry
75	37	5.919	2.293	F clarity
64	38	5.905	2.152	Worry
63	39	5.838	2.100	Anxiety$_b$
37	40	5.777	2.105	Worry
61	41	5.696	1.806	Worry

Table B (Continued)

Statement	Rank	Mean	S. D.	Category
32	42	5.676	1.613	Boredom
46	43	5.669	2.032	Worry merga+a
38	44	5.601	2.033	$Anxiety_w$
10	45	5.486	2.136	$Anxiety_b$
57	46	5.439	2.041	Boredom centatt
71	47	5.426	2.021	Boredom
76	48	5.399	2.140	Boredom
21	49	5.358	1.859	$Anxiety_b$
50	50	5.345	2.039	Worry
60	51	5.338	2.570	Boredom
66	52	5.291	1.723	Worry
73	53	5.243	1.809	Boredom lossego
36	54.5	5.223	1.641	Boredom clarity
74	54.5	5.223	1.649	$Anxiety_b$
69	56	5.196	2.457	NF clarity
43	57	5.182	1.710	$Anxiety_b$
35	58.5	5.122	1.993	$Anxiety_b$
42	58.5	5.122	2.010	Boredom merga+a
12	60	5.095	2.021	$Anxiety_w$
26	61	4.865	1.809	$Anxiety_b$
9	62	4.818	2.477	Worry
47	63	4.777	1.641	Boredom control
33	64	4.709	2.038	Boredom
29	65	4.703	2.065	$Anxiety_w$
44	66	4.696	1.937	Boredom
8	67	4.649	1.877	$Anxiety_b$
5	68	4.628	1.691	Boredom
65	69	4.622	2.551	NF control
25	70	4.507	1.820	Boredom autotlc
55	71	4.500	1.724	Boredom
19	72	4.405	2.089	$Anxiety_b$
41	73	4.351	2.364	$Anxiety_w$
27	74	4.020	2.022	NF centattn
62	75	4.014	2.064	NF lossego
51	76	3.932	2.012	NF merga+a
28	77	3.581	1.986	Worry
48	78	3.439	1.907	Worry
49	79	3.378	1.964	$Anxiety_w$
4	80	2.932	2.557	$Anxiety_w$

N = 148

Note. F = Flow, NF = nonflow, merga+a = merging of action and awareness, centatt = centering of attention, lossego = loss of ego, autotlc = autotelic nature, and s/c = skill/challenge.

Table C

Descriptive Sport Flow Q Sort Data

for Men Athletes

Statement	Rank	Mean	S. D.	Category
53	1	8.538	1.793	F general
14	2	8.302	1.886	F control s/c
58	3	8.148	1.682	F autotlc s/c
7	4	8.142	2.100	F general
70	5	8.107	2.252	F merga+a
45	6	8.024	2.225	F centatt
6	7	7.982	2.323	F centatt
72	8	7.876	1.900	F centatt s/c
2	9	7.775	2.370	F merga+a
17	10.5	7.746	2.107	Worry
54	10.5	7.746	1.955	F merga+a s/c
15	12	7.675	2.106	F control
67	13	7.651	2.085	F control
13	14	7.515	2.462	F lossego
80	15	7.426	2.192	F clarity s/c
11	16	7.379	2.322	F centatt
68	17	7.367	1.978	Worry
39	18	7.361	1.834	$Anxiety_w$
79	19	7.355	2.496	F autotlc
20	20	7.343	2.413	Worry
77	21	7.225	2.254	F clarity
1	22	7.207	2.096	F merga+a
34	23	7.124	2.356	F autotlc
30	24	7.083	2.161	F clarity
22	25	6.941	2.208	F control
31	26	6.834	2.549	$Anxiety_w$
59	27	6.799	2.487	F autotlc
78	28	6.775	2.556	F lossego
18	29	6.740	2.239	F lossego
75	30	6.704	2.165	F clarity
40	31	6.580	2.120	F lossego s/c
16	32	6.456	2.370	NF autotlc
63	33	6.284	2.169	$Anxiety_b$
52	34	6.030	2.269	$Anxiety_w$
9	35	6.024	2.725	Worry
56	36	5.905	2.030	Boredom
71	37	5.888	2.134	Boredom
32	38	5.710	2.266	Boredom
24	39	5.645	2.635	Worry
43	40	5.562	1.886	$Anxiety_b$

Table C (Continued)

Statement	Rank	Mean	S. D.	Category
76	41	5.509	2.068	Boredom
3	42	5.497	2.582	Worry Lossego
60	43	5.450	2.659	Boredom
41	44	5.426	2.572	Anxiety$_w$
42	45	5.420	2.109	Boredom merga+a
57	46	5.414	1.888	Boredom centatt
33	47	5.355	2.326	Boredom
38	48	5.343	2.255	Anxiety$_w$
21	49	5.331	1.870	Anxiety$_b$
35	50	5.320	2.083	Anxiety$_b$
46	51	5.308	2.247	Worry merga+a
10	52	5.290	2.346	Anxiety$_b$
69	53	5.225	2.459	NF clarity
66	54.5	5.219	1.904	Worry
73	54.5	5.219	1.824	Boredom lossego
36	56	5.201	1.778	Boredom clarity
74	57	5.136	1.829	Anxiety$_b$
55	58	5.124	1.989	Boredom
44	59	5.089	2.020	Boredom
26	60	5.053	2.019	Anxiety$_b$
12	61.5	5.030	1.922	Anxiety$_w$
47	61.5	5.030	1.757	Boredom control
37	63	4.953	2.002	Worry control
23	64	4.947	2.108	Worry autotlc
25	65	4.900	1.834	Boredom autotlc
61	66	4.888	1.843	Worry clarity
50	67	4.876	2.393	Worry
65	68	4.822	2.421	NF control
62	69	4.793	2.257	NF lossego
64	70	4.763	2.188	Worry centatt
5	71	4.621	2.098	Boredom
29	72	4.574	2.058	Anxiety$_w$
8	73	4.503	1.912	Anxiety$_b$
19	74	4.497	2.102	Anxiety$_b$
51	75	4.148	2.031	NF merga+a
27	76	4.089	2.138	NF centatt
28	77	3.787	2.006	Worry
49	78	3.604	2.042	Anxiety$_w$
4	79	3.296	2.407	Anxiety$_w$
48	80	3.178	1.907	Worry

N = 170

Note. F = flow, NF = nonflow, merga+a = merging of action and awareness, centatt = centering of attention, lossego = loss of ego, autotlc = autotelic nature, and s/c = skill/challenge.

Table D

Descriptive Sport Flow Q Sort Data for Baseball

Statement	Rank	Mean	S. D.	Category
45	1	9.070	1.514	F centatt
53	2	8.643	1.726	F general
15	3	8.607	1.618	F control
17	4	8.536	1.732	Worry
6	5.5	8.429	2.185	F centatt
7	5.5	8.429	2.395	F general
14	7	8.393	2.025	F control s/c
58	8	8.286	1.802	F autotlc s/c
30	9	7.857	1.758	F clarity
1	10	7.821	2.056	F merga+a
78	11	7.786	2.754	F lossego
67	12.5	7.714	2.158	F control
80	12.5	7.714	2.016	F clarity s/c
2	14	7.679	1.847	F merga+a
13	15.5	7.607	2.331	F lossego
70	15.5	7.607	2.043	F merga+a
11	17	7.536	2.560	F centatt
79	18	7.500	2.427	F autotlc
20	19	7.429	2.486	Worry
72	20	7.321	1.827	F centatt s/c
18	21	7.250	2.287	F lossego
54	22	7.214	1.813	F merga+a s/c
75	23	7.179	1.611	F clarity
39	24.5	7.107	2.166	$Anxiety_w$
68	24.5	7.107	1.423	Worry
9	26.5	7.071	2.801	Worry
77	26.5	7.071	1.631	F clarity
34	28	7.000	1.866	F autotlc
22	29	6.929	1.999	F control
41	30	6.893	2.331	$Anxiety_w$
40	31	6.857	2.013	F lossego
59	32	6.821	2.178	F autotlc
63	33	6.500	2.457	$Anxiety_b$
16	34	6.462	2.301	NF autotlc
31	35.5	6.107	2.572	$Anxiety_w$
60	35.5	6.107	2.572	Boredom
43	37	5.929	1.741	$Anxiety_b$
56	38.5	5.893	2.025	Boredom
71	38.5	5.893	1.771	Boredom
74	40	5.821	1.701	$Anxiety_b$

Table D (Continued)

Statement	Rank	Mean	S. D.	Category
52	41	5.714	1.883	$Anxiety_w$
35	42.5	5.607	2.183	$Anxiety_b$
69	42.5	5.607	2.079	NF clarity
62	44	5.571	1.894	NF lossego
10	45	5.464	2.589	$Anxiety_b$
55	46	5.321	2.019	Boredom
65	47.5	5.286	1.823	NF control
76	47.5	5.286	1.941	Boredom
21	49	5.250	1.917	$Anxiety_b$
44	50	5.214	2.114	Boredom
73	51	5.179	1.188	Boredom lossego
38	52.5	5.143	1.995	$Anxiety_w$
42	52.5	5.143	2.138	Boredom merga+a
32	55	5.107	1.873	Boredom
47	55	5.107	1.397	Boredom control
57	55	5.107	1.571	Boredom centatt
26	57.5	5.071	2.017	$Anxiety_b$
46	57.5	5.071	1.824	Worry merga+a
36	59	4.964	1.774	Boredom clarity
12	61	4.821	1.964	$Anxiety_w$
33	61	4.821	2.389	Boredom
66	61	4.821	1.786	Worry
25	64	4.571	1.933	Boredom autotlc
27	64	4.571	2.332	NF centatt
51	64	4.571	2.251	NF merga+a
61	66	4.536	1.644	Worry clarity
3	68	4.321	2.957	Worry lossego
24	68	4.321	2.776	Worry
29	68	4.321	2.038	$Anxiety_w$
37	70	4.071	1.538	Worry control
19	71.5	4.056	2.333	$Anxiety_b$
23	71.5	4.036	1.710	Worry autotlc
5	73	4.000	1.866	Boredom
64	74	3.929	1.741	Worry centatt
8	75	3.893	2.166	$Anxiety_b$
50	76	3.857	1.820	Worry
49	77	3.536	1.621	$Anxiety_w$
48	78	3.464	2.117	Worry
28	79	3.393	1.853	Worry
4	80	2.893	2.114	$Anxiety_w$

N = 28

Note. F = flow, NF = nonflow, merga+a = merging of action and awareness, centatt = centering of attention, lossego = loss of ego, autotlc = autotelic nature, and s/c = skill/challenge.

Table E

Descriptive Sport Flow Q Sort Data for Football

Statement	Rank	Mean	S. D.	Category
70	1	8.677	1.922	F merga+a
58	2	8.290	2.148	F autotlc s/c
14	3	8.258	1.591	F control s/c
31	4	8.194	2.613	$Anxiety_w$
72	5	8.000	1.807	F centatt s/c
53	6	7.935	2.112	F general s/c
15	7.5	7.871	1.857	F control
39	7.5	7.871	1.910	$Anxiety_w$
67	9	7.806	1.957	F control
80	10	7.710	2.759	F clarity s/c
7	11.5	7.677	2.088	F general s/c
54	11.5	7.677	2.104	F merga+a s/c
6	14	7.516	2.278	F centatt
20	14	7.516	2.407	Worry
75	14	7.516	2.264	F clarity
2	16.5	7.323	2.663	F merga+a
68	16.5	7.323	2.535	Worry
78	18	7.161	2.570	F lossego
17	19	7.097	2.688	Worry
22	20.5	7.032	2.152	F control
77	20.5	7.032	2.652	F clarity
13	22	6.903	2.521	F lossego
1	23	6.871	1.857	F merga+a
45	24.5	6.710	2.194	F centatt
52	24.5	6.710	2.452	Boredom merga+a
32	26	6.645	1.644	Boredom
34	27	6.581	2.592	F autotlc
79	28	6.484	2.931	F autotlc
11	29	6.419	2.391	F centatt
16	30	6.355	2.122	NF autotlc
18	32	6.226	2.320	F lossego
30	32	6.226	2.486	F clarity
35	32	6.226	1.726	Boredom
56	34.5	6.194	2.104	Boredom
63	34.5	6.194	2.072	$Anxiety_b$
42	36	6.032	2.258	Boredom merga+a
9	37	5.968	2.483	Worry
3	38	5.935	2.804	Worry lossego
24	39	5.935	2.632	Worry
76	40	5.903	2.039	Boredom

Table E (Continued)

Statement	Rank	Mean	S. D.	Category
40	42	5.806	2.469	F lossego s/c
43	42	5.806	2.120	$Anxiety_b$
71	42	5.806	2.242	Boredom
57	44	5.742	2.033	Boredom
10	45.5	5.710	2.194	$Anxiety_b$
73	45.5	5.710	1.883	Boredom lossego
33	47	5.677	2.227	Boredom
36	48	5.645	2.184	Boredom clarity
59	49	5.613	2.929	F autotlc
47	50	5.484	2.127	Boredom control
55	51	5.419	1.766	Boredom
26	52.5	5.323	1.904	$Anxiety_b$
74	52.5	5.323	1.833	$Anxiety_b$
29	54	5.258	1.966	$Anxiety_w$
64	55	5.097	2.329	Worry centatt
27	56	4.943	1.868	NF centatt
21	58	4.935	1.914	$Anxiety_b$
38	58	4.935	2.175	$Anxiety_w$
41	58	4.935	2.407	$Anxiety_w$
44	60.5	4.871	1.996	Boredom
50	60.5	4.871	2.526	Worry
5	64	4.839	2.296	Boredom
8	64	4.839	1.846	$Anxiety_b$
25	64	4.839	1.934	Boredom autotlc
46	64	4.839	1.899	Worry merga+a
60	64	4.839	2.423	Boredom
12	67	4.742	1.788	$Anxiety_w$
37	68	4.710	2.194	Worry control
23	69	4.645	2.524	Worry autotlc
19	71	4.581	2.062	$Anxiety_b$
62	71	4.581	2.643	NF lossego
69	71	4.581	2.540	NF clarity
61	73	4.548	1.947	Worry clarity
51	74	4.516	2.096	NF merga+a
66	75	4.452	2.204	Worry
49	76	4.290	2.397	$Anxiety_w$
65	77	4.258	2.160	NF control
28	78	4.032	1.941	Worry
4	79	3.774	2.499	$Anxiety_w$
48	80	3.226	1.726	Worry

N = 31

Note. F = flow, NF = nonflow, merga+a = merging of action and awareness, centatt = centering of attention, lossego = loss of ego, autotlc = autotelic nature, and s/c = skill/challenge.

Table F

Descriptive Sport Flow Q Sort Data for Golf

Statement	Rank	Mean	S. D.	Category
14	1	8.905	1.590	F control s/c
45	2	8.786	2.280	F centatt
58	3	8.405	1.697	F autotlc s/c
68	4	8.333	1.803	Worry
7	5	8.310	1.893	F general s/c
2	6	8.286	2.521	F merga+a
53	7	8.214	1.894	F general s/c
67	8	8.190	2.189	F control
17	9	8.143	1.995	Worry
72	10	8.048	1.652	F centatt s/c
6	11	8.000	2.469	F centatt
54	12	7.976	1.969	F merga+a s/c
70	13	7.857	2.269	F merga+a
15	14	7.643	2.583	F control
79	15	7.381	2.118	F autotlc
11	16.5	7.333	2.476	F centatt
59	16.5	7.333	2.044	F autotlc
22	18	7.262	2.338	F control
39	19	7.071	1.968	Anxiety_{w}
77	20	7.048	1.999	F clarity
13	21.5	6.929	2.815	F lossego
20	21.5	6.929	2.299	Worry
34	23	6.857	2.591	F autotlc
80	24	6.786	2.192	F clarity s/c
40	25	6.667	2.205	F lossego s/c
1	26	6.548	1.580	F merga+a
38	27	6.429	2.349	Anxiety_{w}
31	28	6.405	2.470	Anxiety_{w}
30	29	6.357	2.304	F clarity
16	31	6.310	2.789	NF autotlc
46	31	6.310	2.454	Worry merga+a
69	31	6.310	2.789	NF clarity
52	33	6.262	2.061	Anxiety_{w}
75	34	6.190	2.144	F clarity
18	35	6.071	2.331	F lossego
65	36	6.048	2.556	NF control
37	37	6.024	1.732	Worry control
78	38	6.000	2.528	F lossego
24	39	5.976	2.875	Worry
50	40	5.929	2.053	Worry

Table F (Continued)

Statement	Rank	Mean	S. D.	Category
57	41	5.905	2.034	Boredom centatt
61	42	5.881	1.837	Worry clarity
3	43	5.857	2.692	Worry lossego
64	44	5.762	2.162	Worry centatt
23	45	5.738	2.307	Worry autotlc
56	46	5.690	1.944	Boredom
21	47	5.595	1.862	$Anxiety_b$
12	48.5	5.524	1.978	$Anxiety_w$
71	48.5	5.524	2.039	Boredom
66	50	5.500	1.534	Worry
60	51	5.452	2.549	Boredom
10	52	5.357	2.196	$Anxiety_b$
73	53	5.190	1.811	Boredom lossego
76	54	5.143	2.291	Boredom
32	55.5	5.119	1.864	Boredom
63	55.5	5.119	1.915	$Anxiety_b$
74	57	5.071	1.786	$Anxiety_b$
42	58	4.929	1.866	Boredom merga+a
43	59	4.905	1.750	$Anxiety_b$
36	60	4.857	1.775	Boredom clarity
29	61	4.762	2.218	$Anxiety_w$
19	62	4.714	1.865	$Anxiety_b$
47	63	4.667	1.588	Boredom control
62	64	4.643	2.218	NF lossego
55	65	4.595	1.822	Boredom
33	66.5	4.571	1.990	Boredom
35	66.5	4.571	1.500	$Anxiety_b$
5	68	4.548	1.714	Boredom
44	69	4.476	2.189	Boredom
9	70	4.310	2.474	Worry
26	71	4.286	2.016	$Anxiety_b$
51	72	4.262	1.654	NF merga+a
41	73	4.190	2.329	$Anxiety_w$
49	74	4.095	2.293	$Anxiety_w$
4	75.5	4.048	2.930	$Anxiety_w$
8	75.5	4.048	1.561	$Anxiety_b$
25	77	4.024	1.814	Boredom autotlc
27	78	3.595	1.888	NF centatt
28	79	3.810	2.063	Worry
48	80	3.881	1.978	Worry

N = 42

Note. F = flow, NF = nonflow, merga+a = merging of action and awareness, centatt = centering of attention, lossego = loss of ego, autotlc = autotelic nature, and s/c = skill/challenge.

Table G

Descriptive Sport Flow Q Sort Data for Lacrosse

Statement	Rank	Mean	S. D.	Category
14	1	8.620	1.604	F control s/c
53	2	8.608	1.772	F general s/c
54	3	8.380	1.697	F merga+a s/c
58	4	8.266	1.412	F autotlc s/c
7	5	8.253	1.721	F general s/c
72	6	8.241	1.619	F centatt
79	7	8.203	2.078	F autotlc
59	8.5	7.949	2.423	F autotlc
68	8.5	7.949	1.543	Worry
2	10	7.924	2.011	F merga+a
11	11.5	7.747	1.871	F centatt
17	11.5	7.747	2.028	Worry
70	13	7.696	2.322	F merga+a
6	14	7.595	2.415	F centatt
67	15	7.582	2.110	F contatt
77	16	7.570	2.146	F clarity
45	17	7.544	2.219	F centatt
20	18	7.494	2.275	Worry
13	19	7.443	2.556	F lossego
39	20	7.367	1.763	Anxiety_{w}
80	21	7.278	2.270	F clarity s/c
15	23	7.241	2.271	F control
30	23	7.241	2.208	F clarity
40	23	7.241	1.763	F lossego
34	25	7.228	2.247	F autotlc
1	26	7.127	2.065	F merga+a
24	27	6.684	2.499	Worry
16	28.5	6.570	2.416	NF autotlc
18	28.5	6.570	2.274	F lossego
22	30	6.443	2.159	F control
63	31	6.418	2.061	Anxiety_{b}
3	32	6.203	2.638	Worry lossego
78	33	6.089	2.543	F lossego s/c
71	34	6.051	2.112	Boredom
31	35	6.000	2.855	Anxiety_{w}
52	36	5.949	1.974	Anxiety_{w}
23	37	5.937	2.350	Worry autotlc
56	38	5.886	2.032	Boredom
75	39	5.848	2.131	F clarity
32	40	5.835	1.904	Boredom

Table G (Continued)

Statement	Rank	Mean	S. D.	Category
64	41	5.734	2.049	Worry centatt
42	42	5.709	1.956	Boredom merga+a
37	43	5.570	2.134	Worry control
61	44	5.557	2.024	Worry clarity
46	46	5.544	2.031	Boredom centatt
57	46	5.544	1.824	Worry merga+a
76	46	5.544	2.011	Boredom
10	48.5	5.519	1.980	$Anxiety_b$
21	48.5	5.519	2.012	$Anxiety_b$
43	50	5.494	1.873	$Anxiety_b$
36	51	5.456	1.767	Boredom clarity
33	52	5.418	2.211	Boredom
73	53	5.367	1.770	Boredom lossego
35	54.5	5.342	1.973	$Anxiety_w$
50	54.5	5.342	2.093	Worry
66	56	5.329	1.781	Worry
38	57	5.291	1.889	$Anxiety_w$
9	58	5.278	2.655	Worry
74	59	5.063	1.749	$Anxiety_b$
12	60	4.975	2.207	$Anxiety_w$
47	61	4.949	1.701	Boredom control
26	62	4.810	1.882	$Anxiety_b$
44	63.5	4.785	1.985	Boredom
60	63.5	4.785	2.610	Boredom
25	65	4.747	1.829	Boredom autotlc
29	66	4.646	1.833	$Anxiety_w$
55	67.5	4.671	1.906	Boredom
69	67.5	4.671	2.263	NF clarity
8	69	4.532	1.940	$Anxiety_b$
41	70	4.494	2.485	$Anxiety_w$
65	71	4.392	2.462	NF control
5	72	4.367	1.936	Boredom
62	73	4.025	2.281	NF lossego
19	74	3.785	1.966	$Anxiety_b$
27	75	3.747	2.009	NF centatt
51	76	3.709	1.956	NF merga+a
28	77	3.291	1.855	Worry
49	78	3.266	1.899	$Anxiety_w$
48	79	3.203	1.800	Worry
4	80	2.456	1.810	$Anxiety_w$

N = 79

Note. F = flow, NF = nonflow, merga+a = merging of action and awareness, centatt = centering of attention, lossego = loss of ego, autotlc = autotelic nature, and s/c = skill/challenge.

Table H

Descriptive Sport Flow Q Sort Data for Softball

Statement	Rank	Mean	S. D.	Category
53	1	9.219	1.497	F general s/c
59	2	9.000	1.967	F autotlc
14	3	8.938	1.268	F control s/c
79	4	8.750	1.984	F autotlc
58	5	8.469	1.545	F general s/c
72	6	8.094	1.510	F centatt s/c
2	7.5	8.063	1.848	F merga+a
7	7.5	8.063	1.950	F general s/c
77	9	7.969	2.177	F clarity
45	10	7.875	2.028	F centatt
39	11	7.781	1.453	Anxiety_{w}
11	13	7.750	2.300	F centatt
15	13	7.750	2.229	F control
67	13	7.750	2.155	F control
22	15	7.688	2.206	F control
13	16	7.625	2.393	F lossego
20	17	7.594	2.270	Worry
70	18	7.563	2.355	F merga+a
17	19.5	7.531	2.032	Worry
68	19.5	7.531	1.741	Worry
30	21.5	7.469	2.514	F clarity
54	21.5	7.469	2.272	F merga+a s/c
1	23.5	7.250	2.328	F merga+a
80	23.5	7.250	1.814	F clarity s/c
24	25	7.031	2.335	Worry
52	26	6.906	1.634	Anxiety_{w}
31	27	6.875	2.498	Anxiety_{w}
75	28	6.813	2.278	F clarity
6	29	6.781	2.992	F centatt
18	30.5	6.656	2.073	F lossego
40	30.5	6.656	1.825	F lossego s/c
16	32.5	6.625	2.152	NF autotlc
56	32.5	6.625	1.497	Boredom
34	34	6.375	2.915	F autotlc
3	35	6.250	2.286	Worry lossego
63	36	6.094	2.146	Anxiety_{b}
38	37	5.969	1.787	Anxiety_{w}
46	38	5.938	1.900	Worry merga+a
78	39	5.875	2.814	F lossego
64	40	5.844	1.648	Worry centatt

Table H (Continued)

Statement	Rank	Mean	S. D.	Category
60	41	5.781	2.196	Boredom
23	42	5.750	2.110	Worry autotlc
61	43	5.656	1.658	Worry clarity
37	44	5.625	2.352	Worry control
32	45	5.531	1.934	Boredom
43	46	5.500	1.646	$Anxiety_b$
74	47	5.438	1.883	$Anxiety_b$
21	48	5.313	1.786	$Anxiety_b$
50	49	5.219	1.879	Worry
66	50	5.188	1.469	Worry
71	51.5	5.156	1.919	Boredom
76	51.5	5.156	2.172	Boredom
36	53	5.125	1.792	Boredom clarity
69	54	5.031	2.559	NF clarity
12	55	5.000	1.481	$Anxiety_w$
19	56	4.938	1.917	$Anxiety_b$
10	57	4.906	2.428	$Anxiety_b$
57	58	4.875	1.561	Boredom centatt
35	59.5	4.844	2.384	$Anxiety_b$
44	59.5	4.844	1.780	Boredom
26	61	4.813	1.378	$Anxiety_b$
29	62	4.781	1.996	$Anxiety_w$
47	63.5	4.750	1.481	Boredom control
73	63.5	4.750	1.778	Boredom lossego
42	65	4.719	2.098	Boredom merga+a
8	66	4.656	1.450	$Anxiety_b$
9	67	4.594	2.014	Worry
65	68	4.563	2.620	NF control
55	69	4.500	1.320	Boredom
5	70	4.469	1.218	Boredom
33	71	4.375	2.060	Boredom
25	72	4.219	1.560	Boredom autotlc
41	73	4.188	1.991	$Anxiety_w$
51	74	3.813	1.975	NF merga+a
27	75	3.656	1.928	NF centatt
62	76	3.500	1.723	NF lossego
28	77	3.344	1.789	Worry
48	78.5	2.813	1.942	Worry
49	78.5	2.813	1.306	$Anxiety_w$
4	80	2.031	1.787	$Anxiety_w$

N = 32

Note. F = flow, NF = nonflow, merga+a = merging of action and awareness, centatt = centering of attention, lossego = loss of ego, autotlc = autotelic nature, and s/c = skill/challenge.

Table I

Descriptive Sport Flow Q Sort Data for Tennis

Statement	Rank	Mean	S. D.	Category
45	1	9.057	1.830	F centatt
7	2	8.400	2.172	F general s/c
72	3	8.143	2.238	F centatt s/c
53	4	8.086	2.120	F general s/c
15	5.5	7.971	1.807	F autotlc s/c
58	5.5	7.971	1.317	F control
14	7	7.914	2.161	F control s/c
54	8	7.857	1.417	F merga+a s/c
20	9	7.743	2.005	Worry
13	10.5	7.657	2.645	F lossego
77	10.5	7.657	2.722	F clarity
2	13	7.629	2.263	F merga+a
17	13	7.629	1.896	Worry
70	13	7.629	2.451	F merga+a
11	15	7.543	2.331	F centatt
79	16	7.400	2.912	F autotlc
67	17	7.371	2.647	F control
80	18	7.314	2.285	F clarity s/c
1	19	7.257	2.536	F merga+a
59	20	7.229	2.860	F autotlc
6	22	6.971	2.514	F centatt
39	22	6.971	1.963	$Anxiety_w$
68	22	6.971	2.007	Worry
30	24	6.829	2.189	F clarity
78	25	6.800	2.826	F lossego
40	26	6.771	2.157	F lossego s/c
22	27	6.400	2.172	F control
16	28	6.371	2.377	NF autotlc
56	29	6.286	1.840	Boredom
34	30	6.257	2.726	F autotlc
18	31	6.200	2.361	$Anxiety_b$
9	32	6.086	2.241	Worry
57	33.5	6.057	2.338	Boredom centatt
73	33.5	6.057	2.141	Boredom lossego
26	35	6.000	2.288	$Anxiety_b$
24	36	5.914	2.331	Worry
3	37	5.886	2.346	Worry lossego
42	38.5	5.857	1.942	Boredom merga+a
76	38.5	5.857	2.366	Boredom
32	40	5.800	1.549	Boredom

Table I (Continued)

Statement	Rank	Mean	S. D.	Category
25	43	5.743	2.034	Boredom autotlc
33	43	5.743	2.501	Boredom
46	43	5.743	2.201	Worry merga+a
52	43	5.743	1.945	$Anxiety_w$
63	43	5.743	2.267	$Anxiety_b$
69	46	5.686	2.621	NF clarity
31	47	5.657	3.048	$Anxiety_w$
37	48	5.629	1.848	Worry control
61	49	5.514	2.077	Worry clarity
71	50	5.486	2.161	Boredom
23	52	5.400	2.003	Worry autotlc
60	52	5.400	2.725	Boredom
74	52	5.400	1.701	$Anxiety_b$
36	54	5.314	1.491	Boredom clarity
75	55	5.286	2.177	F clarity
66	56	5.229	1.972	Worry
43	57	5.200	1.605	$Anxiety_b$
35	58.5	5.171	2.051	$Anxiety_b$
41	58.5	5.171	2.256	$Anxiety_w$
5	60	5.143	1.717	Boredom
8	62.5	5.114	2.083	$Anxiety_b$
21	62.5	5.114	1.676	$Anxiety_b$
47	62.5	5.114	1.827	Boredom control
64	62.5	5.114	2.529	Worry centatt
10	65	5.057	2.363	$Anxiety_b$
38	66	4.800	2.260	$Anxiety_w$
44	67	4.771	1.646	Boredom
12	68.5	4.743	2.160	$Anxiety_w$
19	68.5	4.743	2.160	$Anxiety_w$
65	70	4.714	2.515	NF control
28	71	4.600	2.391	Worry
55	72	4.457	2.077	Boredom
62	73	4.429	1.867	NF lossego
27	74	4.314	1.906	NF centatt
51	75	4.257	1.884	NF merga+a
50	76	4.200	2.098	Worry
29	77	3.829	1.823	$Anxiety_w$
4	78	3.371	2.819	$Anxiety_w$
48	79	3.343	1.999	Worry
49	80	2.571	1.668	$Anxiety_w$

N = 34

Note. F = flow, NF - nonflow, merga+a = merging of action and awareness, centatt = centering of attention, lossego = loss of ego, autotlc = autotelic nature, and s/c = skill/challenge.

Table J

Descriptive Sport Flow Q Sort Data for Track

Statement	Rank	Mean	S.D.	Category
53	1	8.574	1.839	F general s/c
7	2	8.213	1.744	F general s/c
58	3.5	8.191	1.583	F autotlc s/c
70	3.5	8.191	2.410	F merga+a
79	5	8.064	2.616	F autotlc
6	6.5	8.106	2.238	F centatt
14	6.5	8.106	1.760	F control s/c
67	8	8.000	2.217	F control
17	9	7.830	1.982	Worry
54	10	7.809	1.610	F merga+a s/c
45	11	7.787	2.126	F centatt
2	12	7.745	2.583	F merga+a
72	13	7.702	1.921	F centatt s/c
15	14	7.681	1.990	F control
13	15	7.660	2.248	F lossego
20	16	7.617	2.472	Worry
77	17	7.596	2.113	F clarity
39	18.5	7.468	1.898	$Anxiety_w$
68	18.5	7.468	1.987	Worry
59	20	7.383	2.112	F autotlc
30	21	7.340	1.981	F clarity
11	22.5	7.213	2.245	F centatt
34	22.5	7.213	2.686	F autotlc
22	24	7.021	1.984	F control
80	25	7.000	1.681	F clarity s/c
1	26	6.872	2.419	F merga+a
18	27	6.766	2.228	F lossego
78	28	6.702	2.367	F Lossego
31	29.5	6.553	2.569	$Anxiety_w$
75	29.5	6.553	2.430	F clarity
16	31	6.532	2.628	NF autotlc
40	32	6.489	2.358	F lossego s/c
60	33	6.319	2.486	Boredom
52	34	6.298	2.661	$Anxiety_w$
63	35	6.255	2.121	$Anxiety_b$
3	36	6.234	2.370	Worry lossego
24	37	6.021	2.762	Worry
66	38	5.872	1.676	Worry
56	39	5.851	2.126	Boredom
38	40	5.787	2.340	$Anxiety_w$

Table J (Continued)

Statement	Rank	Mean	S.D.	Category
50	41	5.638	2.557	Worry
12	42.5	5.596	1.919	$Anxiety_w$
23	42.5	5.596	2.174	Worry autotlc
44	44	5.468	2.175	Boredom
32	45	5.383	1.311	Boredom
10	46	5.362	2.453	$Anxiety_b$
71	47	5.255	2.069	Boredom
37	48	5.234	2.257	Worry control
35	49	5.149	2.085	$Anxiety_b$
64	50.5	5.106	2.522	Worry centatt
69	50.5	5.106	2.189	NF clarity
21	52	5.085	1.886	$Anxiety_b$
76	53	5.064	1.660	Boredom
43	55	5.064	1.673	$Anxiety_b$
46	55	5.043	2.303	Worry merga+a
61	55	5.043	1.654	Worry clarity
5	58	4.936	1.712	Boredom
9	58	4.936	2.839	Worry
55	58	4.936	2.269	Boredom
36	60	4.851	1.122	Boredom clarity
29	62	4.830	2.488	$Anxiety_w$
47	62	4.830	1.672	Boredom control
65	62	4.830	2.632	NF control
62	64	4.787	2.074	NF lossego
41	65	4.766	2.639	$Anxiety_w$
74	66	4.745	1.635	$Anxiety_b$
25	67	4.681	1.534	Boredom autotlc
26	68	4.660	1.845	$Anxiety_b$
8	69.5	4.553	1.886	$Anxiety_b$
73	69.5	4.553	1.558	Boredom lossego
57	71	4.532	1.965	Boredom centatt
19	72	4.468	2.135	$Anxiety_b$
42	73	4.404	2.050	Boredom merga+a
33	74	4.319	1.696	Boredom
27	75	4.191	2.252	NF centatt
51	76	4.085	2.244	NF merga+a
49	77	3.957	2.186	$Anxiety_w$
28	78	3.894	2.035	Worry
4	79	3.617	2.875	$Anxiety_w$
48	80	3.298	1.933	Worry

N = 47

Note. F= flow, NF = nonflow, merga+a = merging of action and awareness, centatt = centering of attention, lossego = loss of ego, autotlc = autotelic nature, and s/c = skill/challenge.

Table K

Descriptive Flow Experiential State and Flow Element Data for All Athletes

	Mean	S. D.
Experiential State		
Flow	7.507	0.666
Nonflow	4.832	1.174
Worry	5.617	0.844
$Anxiety_w$	5.181	0.796
Worry-$Anxiety_w$	5.454	0.673
Boredom	5.230	0.775
$Anxiety_b$	5.179	0.678
Boredom-$Anxiety_b$	5.211	0.619
Element		
Merga+a	7.643	1.170
Centatt	7.794	1.219
Lossego	6.817	1.337
Control	7.715	1.155
Clarity	7.029	1.342
Autotelic	7.626	1.344
General	8.347	1.321

N = 318

Table L

Descriptive Flow Experiential State and Flow Element Data for Men and Women Athletes

Category	Women		Men	
	Mean	S. D.	Mean	S. D.
Experiential State				
Flow	7.520	0.687	7.497	0.648
Nonflow	4.726	1.193	4.925	1.153
Worry	5.829	0.864	5.433	0.783
$Anxiety_w$	5.077	0.793	5.272	0.789
Worry-$Anxiety_w$	5.547	0.705	5.373	0.636
Boredom	5.119	0.787	5.319	0.738
$Anxiety_b$	5.125	0.656	5.225	0.694
Boredom-$Anxiety_b$	5.122	0.632	5.284	0.587
Element				
Merga+a	7.568	1.113	7.709	1.216
Centatt	7.758	1.219	7.825	1.223
Lossego	6.711	1.380	6.909	1.296
Control	7.799	1.144	7.643	1.163
Clarity	6.924	1.338	7.121	1.343
Autotelic	7.939	1.285	7.353	1.339
General	8.358	1.221	8.338	1.405

Table M

Descriptive Flow Experiential State and Flow Element Data for Sports

Sport	N	Flow		Nonflow	
		Mean	S. D.	Mean	S. D.
Baseball	28	7.705	0.502	5.345	1.042
Football	31	7.205	0.764	4.866	1.144
Golf					
Total	42	7.438	0.646	5.194	1.082
Women	19	7.480	0.670	5.351	0.960
Men	23	7.403	0.639	5.065	1.178
Lacrosse					
Total	79	7.536	0.615	4.519	1.242
Women	50	7.598	0.650	4.493	1.336
Men	29	7.428	0.543	4.563	1.083
Softball	32	7.660	0.634	4.531	1.072
Tennis					
Total	34	7.405	0.339	4.941	1.022
Women	22	7.355	0.804	4.947	0.933
Men	12	7.497	0.622	4.931	1.211
Track					
Total	47	7.538	0.720	4.922	1.322
Women	16	7.433	0.762	4.938	1.323
Men	31	7.592	0.705	4.914	1.344

Table M (Continued)

Sport	N	Worry		Anxiety w		Worry-Anxiety w	
		Mean	S. D.	Mean	S. D.	Mean	S. D.
Baseball	28	5.064	0.537	5.171	0.718	5.104	0.424
Football	31	5.346	0.823	5.634	0.682	5.454	0.599
Golf							
Total	42	5.892	0.791	5.421	0.899	5.715	0.749
Women	19	6.014	0.901	5.392	1.017	5.781	0.856
Men	23	5.791	0.692	5.444	0.810	5.661	0.662
Lacrosse							
Total	79	5.791	0.878	4.938	0.583	5.471	0.666
Women	50	5.951	0.883	4.907	0.584	5.559	0.691
Men	29	5.515	0.813	4.992	0.588	5.319	0.604
Softball	32	5.727	0.751	4.149	0.756	5.510	0.592
Tennis							
Total	34	5.610	0.766	4.752	0.749	5.288	0.605
Women	22	5.679	0.842	4.682	0.737	5.305	0.657
Men	12	5.483	0.617	4.880	0.786	5.257	0.524
Track							
Total	47	5.655	0.915	5.430	0.933	5.571	0.790
Women	16	5.688	0.840	5.389	0.987	5.576	0.783
Men	31	5.639	0.965	5.452	0.920	5.569	0.807

Table M (Continued)

Sport	N	Boredom		Anxiety b		Boredom-Anxiety b	
		Mean	S. D.	Mean	S. D.	Mean	S. D.
Baseball	28	5.181	0.571	5.286	0.665	5.220	0.470
Football	31	5.576	0.702	5.437	0.653	5.524	0.531
Golf							
Total	42	4.979	0.787	4.852	0.625	4.932	0.609
Women	19	4.761	0.778	4.819	0.553	4.783	0.611
Men	23	5.159	0.765	4.879	0.691	5.054	0.591
Lacrosse							
Total	79	5.274	0.764	5.165	0.668	5.233	0.602
Women	50	5.128	0.755	5.007	0.522	5.083	0.566
Men	29	5.526	0.723	5.437	0.802	5.493	0.583
Softball	32	4.992	0.809	5.167	0.648	5.057	0.665
Tennis							
Total	34	5.531	0.830	5.310	0.697	5.449	0.663
Women	22	5.527	0.860	5.389	0.736	5.475	0.706
Men	12	5.539	0.809	5.167	0.624	5.399	0.602
Track							
Total	47	5.026	0.669	5.038	0.626	5.030	0.546
Women	16	5.092	0.618	5.181	0.846	5.125	0.577
Men	31	4.991	0.702	4.946	0.476	4.981	0.533

Table M (Continued)

Sport	N	Merga+a		Centatt		Lossego	
		Mean	S. D.	Mean	S. D.	Mean	S. D.
Baseball	28	7.580	0.979	8.089	1.055	7.375	1.426
Football	31	7.637	1.284	7.161	1.409	6.524	1.309
Golf							
Total	42	7.667	1.249	8.042	1.166	6.417	1.645
Women	19	7.803	0.888	8.184	1.092	6.539	1.895
Men	23	7.554	1.494	7.924	1.235	6.315	1.442
Lacrosse							
Total	79	7.782	1.082	7.782	1.265	6.835	1.157
Women	50	7.625	1.136	7.650	1.298	6.890	1.212
Men	29	8.052	0.939	8.009	1.194	6.741	1.070
Softball	32	7.586	1.058	7.625	1.349	6.703	1.268
Tennis							
Total	34	7.647	1.190	8.000	1.032	6.824	1.377
Women	22	7.330	1.161	7.898	1.060	6.591	1.534
Men	12	8.229	1.052	8.188	0.995	7.250	0.941
Track							
Total	47	7.654	1.258	7.702	1.111	6.904	1.198
Women	16	7.719	1.313	7.531	1.129	6.641	1.176
Men	31	7.621	1.250	7.790	1.111	7.040	1.206

Table M (Continued)

Sport	N	Control		Clarity		Autotelic	
		Mean	S. D.	Mean	S. D.	Mean	S. D.
Baseball	28	7.911	0.861	7.455	0.967	7.402	1.288
Football	31	7.742	1.046	7.121	1.545	6.742	1.488
Golf							
Total	42	8.000	1.121	6.595	1.355	7.494	1.161
Women	19	8.434	0.889	6.355	1.179	7.329	1.269
Men	23	7.641	1.182	6.793	1.480	7.630	1.074
Lacrosse							
Total	79	7.472	1.207	6.984	1.351	7.911	1.095
Women	50	7.525	1.093	7.135	1.271	8.385	0.805
Men	29	7.379	1.398	6.724	1.466	7.095	1.055
Softball	32	8.031	1.191	7.375	1.353	8.148	1.431
Tennis							
Total	34	7.478	1.239	6.801	1.448	7.257	1.415
Women	22	7.443	1.160	6.580	1.625	7.670	1.218
Men	12	7.542	1.426	7.208	0.988	6.500	1.485
Track							
Total	47	7.702	1.143	7.122	1.190	7.713	1.461
Women	16	7.984	0.924	6.922	0.921	7.438	1.699
Men	31	7.556	1.229	7.226	1.309	7.855	1.330

Table N

Kendall Tau Correlation Coefficients Among the Flow Experiential States

	Nonflow	Worry	$Anxiety_w$	$Worry-Anxiety_w$	Boredom	$Anxiety_b$	$Boredom-Anxiety_b$
Flow	-.2548* .0001	-.3339* .0001	-.2355* .0001	-.3755* .0001	-.2202* .00001	-.1719* .00001	-.2452* .0001
Nonflow		.0129 .7383	.0622 .1109	.0414 .2833	-.0578 .1357	-.0555 .1566	-.0707 .0674
Worry			.1749* .00001	.7361* .0001	-.2680* .0001	-.1730* .00001	-.2841* .0001
$Anxiety_w$				.4598* .0001	-.2247* .00001	-.1237** .0016	-.2225* .00001
$Worry-Anxiety_w$					-.3105* .0001	-.1865* .00001	-.3212* .0001
Boredom						.2196* .00001	.7353* .0001
$Anxiety_b$							.4893 .0001

N = 318
* Significant at .0001 level
** Significant at .002 level

Table O

Kendall Tau Correlation Coefficients Among the Flow Elements

	Centatt	Lossego	Control	Clarity	Autotelic
Merga+a	.1839* .00001	.1891* .00001	.0393 .3238	.1491** .0002	.0380 .3387
Centatt		.1840* .00001	.0672 .0913	.0874*** .0275	.0081 .8391
Lossego			.0538 .1751	.2201* .00001	.1382** .0005
Control				.0374 .3457	.0515 .1951
Clarity					.1448** .0003
Autotelic					

N = 318
* Significant at the .0001 level
** Significant at the .0005 level
*** Significant at the .05 level

Table P

Test-Retest Kendall Tau Correlation Coefficients for Flow Experiential States and Flow Elements

Flow Category	Test Mean	Retest Mean	Kendall tau	P-Value
Experiential State				
Flow	7.907	7.998	.5106	.0001
Nonflow	4.450	4.283	.3390	.0030
Worry	5.633	5.440	.5679	.0001
$Anxiety_w$	5.022	4.897	.5382	.0001
$Worry\text{-}Anxiety_w$	5.404	5.244	.6867	.0001
Boredom	5.002	5.108	.6212	.0001
$Anxiety_b$	4.869	4.875	.3858	.0007
$Boredom\text{-}Anxiety_b$	4.952	5.021	.6128	.0001
Element				
Merga+a	7.969	8.138	.3152	.0069
Centatt	8.150	8.225	.4660	.0001
Lossego	7.125	7.394	.4463	.0001
Control	7.894	7.733	.2758	.0175
Clarity	7.550	7.594	.5424	.0001
Autotelic	8.488	8.769	.4242	.0003

N = 40

Table Q

Test Retest Kendall Tau Correlation Coefficients for

Sport Flow Q Sort Statements

Statement	Test Mean	Retest Mean	Kendall Tau	Statement	Test Mean	Retest Mean	Kendall Tau
1	7.750	7.825	.2859***	26	4.725	4.600	.1308
2	8.050	8.525	.4065**	27	4.050	3.450	.1957
3	5.800	5.525	.3319**	28	3.225	2.750	.3440**
4	2.450	2.025	.4325**	29	4.000	4.025	.3083***
5	4.825	5.075	.3261**	30	7.525	7.650	.5425*
6	7.625	7.850	.2960**	31	6.225	6.350	.5106*
7	7.900	8.025	.4289*	32	5.375	5.200	.3002***
8	3.875	3.925	.0600	33	4.150	4.425	.4671*
9	5.700	5.300	.5735*	34	7.200	8.075	.4920*
10	4.950	5.450	.2716***	35	4.650	4.525	.4366*
11	7.600	8.150	.1139	36	4.875	4.875	.1519
12	5.400	4.900	.3713**	37	5.475	5.400	.3880**
13	7.800	7.475	.3393**	38	5.275	5.300	.4006*
14	8.675	8.225	.1555	39	7.650	7.325	.2365
15	7.175	5.575	.2940***	40	6.775	7.800	.4059**
16	6.150	6.550	.2721***	41	5.075	5.375	.5706*
17	8.150	7.750	.2584***	42	5.325	5.275	.3350**
18	7.025	7.175	.4858*	43	5.225	4.975	.2780***
19	4.100	3.800	.1618	44	4.625	4.850	.4261**
20	7.750	7.250	.3139***	45	8.575	8.325	.4049**
21	5.450	5.700	.1492	46	5.300	5.325	.3426**
22	7.275	6.750	.3316**	47	4.575	4.925	.3344**
23	5.300	5.300	.4897*	48	3.150	3.075	.1527
24	5.975	5.800	.3678**	49	3.250	2.950	.1559
25	4.350	4.775	.3336**	50	5.400	5.175	.5469*

Table Q (Continued)

Statement	Test Mean	Retest Mean	Kendall Tau	Statement	Test Mean	Retest Mean	Kendall Tau
51	3.225	3.350	.1332	66	4.850	4.900	.1521
52	5.875	5.825	.3732**	67	8.450	8.375	.4493*
53	8.975	8.525	.2906***	68	8.050	8.025	.2655***
54	8.200	8.375	.3099***	69	5.000	4.400	.3178*
55	4.600	4.700	.3488**	70	7.875	7.825	.3603**
56	6.100	6.250	.5294*	71	5.425	5.200	.3961**
57	5.250	5.175	.5388*	72	8.800	8.575	.1001
58	8.725	8.375	.4873*	73	4.675	5.300	.1905
59	9.075	9.175	.3710**	74	4.925	5.375	.2601
60	5.625	5.650	.4733*	75	6.875	6.975	.3617**
61	5.275	5.325	.2711***	76	5.250	4.850	.4861*
62	3.750	3.550	.2889***	77	8.050	8.125	.4790*
63	5.925	5.525	.4366*	78	6.900	7.125	.3721**
64	5.100	4.875	.3854**	79	8.950	9.450	.2482
65	4.525	4.400	.2414***	80	7.750	7.625	.4182*

N = 40
* Significant at the .001 level
** Significant at the .01 level
*** Significant at the .05 level

Table R

Factor Analysis Summary of the Sport Flow Q Sort

Factor	Number of Statements	Minimum Loading	Maximum Loading	Minimum Communality	Maximum Communality	Eigen-value	Proportion Variance
1	12	.4603	.7151	.5798	.6729	6.793	.085
2	5	.4184	.7663	.6505	.6992	5.126	.064
3	4	.4037	.7158	.6119	.6955	3.158	.039
4	4	.4589	.7202	.6153	.6661	2.800	.035
5	4	.4149	.7321	.6219	.7384	2.352	.029
6	3	.4092	.8087	.5955	.7199	2.094	.026
7	1	.7369	.7369	.6381	.6381	2.025	.025
8	2	.6084	.6173	.6121	.6436	1.892	.024
9	1	.7411	.7411	.6717	.6717	1.802	.023
10	2	.4106	.7252	.6442	.6955	1.655	.021
11	4	.4456	.7379	.4879	.7101	1.639	.020
12	1	.7846	.7846	.6588	.6588	1.502	.019
13	1	.7602	.7602	.6984	.6984	1.473	.018
14	2	.4204	.7364	.6685	.6703	1.452	.018
15	1	.7490	.7490	.6743	.6743	1.415	.018
16	1	.7393	.7393	.6177	.6177	1.380	.017
17	1	.7165	.7165	.6925	.6925	1.325	.017
18	2	.4522	.7473	.6649	.6848	1.298	.016
19	2	.5201	.6982	.5709	.6763	1.262	.016
20	1	.7627	.7627	.6816	.6816	1.246	.016
21	1	.7752	.7752	.7096	.7096	1.181	.015
22	2	.4814	.7020	.6512	.6588	1.153	.014
23	2	.4524	.7302	.5635	.6577	1.131	.014
24	1	.6882	.6882	.6262	.6262	1.122	.014
25	1	.6793	.6793	.6462	.6462	1.075	.013
26	1	.7472	.7472	.6641	.6641	1.067	.013
27	1	.7491	.7491	.6716	.6716	1.045	.013

Table S

T-Tests for Flow Experiential State and

Flow Element Gender Comparisons

Category	Athletes' Means Women	Men	F	PROB> F
Experiential State				
Flow	7.520	7.497	1.12 n.s.	.4599
Nonflow	4.726	4.925	1.07 n.s.	.6673
Worry	5.829	5.433	1.22 n.s.	.2143
$Anxiety_w$	5.077	5.272	1.01 n.s.	.9531
Worry-$Anxiety_w$	5.547	5.373	1.23 n.s.	.1957
Boredom	5.119	5.319	1.14 n.s.	.4168
$Anxiety_b$	5.125	5.225	1.12 n.s.	.4835
Boredom-$Anxiety_b$	5.122	5.284	1.16 n.s.	.3535
Element				
Merga+a	7.568	7.709	1.19 n.s.	.2682
Centatt	7.758	7.825	1.01 n.s.	.9734
Lossego	6.711	6.909	1.13 n.s.	.4269
Control	7.799	7.643	1.03 n.s.	.8405
Clarity	6.924	7.121	1.01 n.s.	.9668
Autotelic	7.939	7.353	1.09 N.S.	.6091

N = 318
DF = 147 and 169

Table T

One-Way Analysis of Variance for Flow Experiential States and Flow Elements by Sport

Source	DF	SS	MS	F	PR>F
Flow					
Between	6	5.329	0.888	2.03 n.s.	0.062
Within	286	125.278	0.438		
Total	292	130.607			
Nonflow					
Between	6	24.288	4.048	2.99*	0.007
Within	286	387.468	1.355		
Total	292	411.755			
Worry					
Between	6	16.703	2.784	4.21*	0.0005
Within	286	189.319	0.662		
Total	292	206.022			
$Anxiety_w$					
Between	6	22.667	3.778	6.60*	0.0001
Within	286	163.808	0.573		
Total	292	186.475			
Worry-$Anxiety_w$					
Between	6	7.938	1.323	3.03*	0.0069
Within	286	124.918	0.437		
Total	292	132.856			
Boredom					
Between	6	13.376	2.229	4.03*	0.0007
Within	286	158.148	0.553		
Total	292	171.524			
$Anxiety_b$					
Between	6	8.286	1.381	3.22*	0.0045
Within	286	122.665	0.429		
Total	292	130.951			
Boredom-$Anxiety_b$					
Between	6	10.475	1.746	5.00*	0.0001
Within	286	99.866	0.349		
Total	292	110.341			

Table T (Continued)

Source	DF	SS	MS	F	PR>F
Merga+a					
Between	6	1.496	0.249	0.19 n.s.	0.9808
Within	286	384.901	1.346		
Total	292	386.397			
Centatt					
Between	6	20.120	3.353	2.29*	0.0354
Within	286	418.461	1.463		
Total	292	438.580			
Lossego					
Between	6	18.683	3.114	1.78 n.s.	0.103
Within	286	500.241	1.749		
Total	292	518.924			
Control					
Between	6	14.308	2.385	1.83 n.s.	0.0931
Within	286	372.680	1.303		
Total	292	386.988			
Clarity					
Between	6	19.412	3.235	1.83 n.s.	0.0931
Within	286	505.609	1.768		
Total	292	525.020			
Autotelic					
Between	6	46.269	7.711	4.52*	0.0002
Within	286	487.834			
Total	292	534.103			

*Critical value of F at the .01 level = 2.80
**Critical value of F at the .05 level = 2.10

Table U

One-Way Analysis of Variance for Flow Experiential States and Flow Elements for Women Athletes

Source	DF	SS	MS	F	PR>F
Flow					
Between	3	1.4305	0.4768	1.03 n.s.	0.3809
Within	119	54.8539	0.4610		
Total	122	56.2844			
Nonflow					
Between	3	12.4031	4.1344	3.11**	0.0285
Within	119	157.9821	1.3276		
Total	122	170.3853			
Worry					
Between	3	2.1447	0.7149	1.00 n.s.	0.3972
Within	119	85.1679	0.7157		
Total	122	87.3125			
$Anxiety_w$					
Between	3	6.2905	2.0968	3.87*	0.0111
Within	119	64.4848	0.5419		
Total	122	70.7753			
$Worry\text{-}Anxiety_w$					
Between	3	2.3601	0.7867	1.66 n.s.	0.1785
Within	119	56.5115	0.4749		
Total	122	58.8716			
Boredom					
Between	3	6.6028	2.2009	3.51**	0.0174
Within	119	74.6384	0.6272		
Total	122	81.2412			
$Anxiety_b$					
Between	3	3.8983	1.2994	3.57**	0.0161
Within	119	43.2931	0.3638		
Total	122	47.1914			
$Boredom\text{-}Anxiety_b$					
Between	3	5.0842	1.6947	4.33*	0.0064
Within	119	46.6093	0.3917		
Total	122	51.6935			

Table U (Continued)

Source	DF	SS	MS	F	PR>F
Merga+a					
Between	3	2.4132	0.8044	0.68 n.s.	0.5688
Within	119	140.4781	1.1805		
Total	122	142.8913			
Centatt					
Between	3	5.0115	1.6705	1.08 n.s.	0.3606
Within	119	183.9376	1.5457		
Total	122	188.9492			
Lossego					
Between	3	2.4167	0.8056	0.41 n.s.	0.7521
Within	119	235.9258	1.9826		
Total	122	238.3425			
Control					
Between	3	15.8982	5.2994	4.35*	0.0062
Within	119	144.9717	1.2182		
Total	122	160.8699			
Clarity					
Between	3	17.1370	5.7123	3.14**	0.0276
Within	119	216.3640	1.8182		
Total	122	233.5010			
Autotelic					
Between	3	18.9314	6.3105	4.83*	0.0034
Within	119	155.4385	1.3062		
Total	122	174.3699			

* Critical value of F at the .01 level = 3.95

** Critical value of F at the .05 level = 2.68

Table V

One-Way Analysis of Variance for Flow Experiential States and Flow Elements for Men Athletes

Source	DF	SS	MS	F	PR>F
Flow					
Between	4	4.3343	1.0836	2.63*	0.037
Within	137	56.4429	0.4120		
Total	141	60.7772			
Nonflow					
Between	4	9.2681	2.3170	1.71 n.s.	0.1523
Within	137	186.1318	1.3586		
Total	141	195.3998			
Worry					
Between	4	8.3877	2.0969	3.38*	0.0114
Within	137	85.0478	0.6208		
Total	141	93.4355			
$Anxiety_w$					
Between	4	7.6322	1.9081	3.38*	0.0114
Within	137	77.3961	0.5649		
Total	141	85.0283			
$Worry\text{-}Anxiety_w$					
Between	4	5.1458	1.2865	3.21*	0.0149
Within	137	54.9722	0.4013		
Total	141	60.1180			
Boredom					
Between	4	7.6509	1.9127	3.98**	0.0044
Within	137	65.9132	0.4811		
Total	141	73.5641			
$Anxiety_b$					
Between	4	7.6414	1.9104	4.36**	0.0024
Within	137	60.0394	0.4382		
Total	141	67.6808			
$Boredom\text{-}Anxiety_b$					
Between	4	7.1611	1.7903	6.11**	0.0001
Within	137	40.1666	0.2932		
Total	141	47.3277			

Table V (Continued)

Source	DF	SS	MS	F	PR>F
Merga+a					
Between	4	4.7869	1.1967	0.84 n.s.	0.5043
Within	137	196.0124	1.4307		
Total	141	200.7993			
Centatt					
Between	4	16.5402	4.1351	2.83*	0.0270*
Within	137	200.0971	1.4606		
Total	141	216.6373			
Lossego					
Between	4	18.8785	4.7196	2.84*	0.0267*
Within	137	227.8314	1.6630		
Total	141	246.7099			
Control					
Between	4	4.5587	1.1397	0.85 n.s.	0.4957
Within	137	183.6068	1.3402		
Total	141	188.1655			
Clarity					
Between	4	10.2141	2.5535	1.36 n.s.	0.2500
Within	137	256.6596	1.8734		
Total	141	266.8737			
Autotelic					
Between	4	23.0836	5.7709	3.58**	0.0083*
Within	137	220.8601	1.6121		
Total	141	243.9467			

* Critical value of F at the .01 level = 3.32

** Critical value of F at the .05 level = 2.21

Table W

Significant Scheffé Tests Between Sport Means for Flow Experiential States and Flow Elements of All Athletes

Flow Category	Sports and Means in Comparison				F
Nonflow	B	5.345,	L	4.519	2.3247**
Worry	B	5.064,	G	5.892	2.9014*
Worry	B	5.064,	L	5.749	2.7499**
$Anxiety_w$	F	5.634,	L	4.938	3.1312*
$Anxiety_w$	F	5.634,	T	4.752	3.6676*
$Anxiety_w$	G	5.421,	T	4.752	2.4471**
$Anxiety_w$	T	4.752,	Tr	5.430	2.3708**
Worry-$Anxiety_w$	B	5.104,	G	5.715	2.3929**
Boredom	F	5.576,	G	4.979	1.9151 n.s.
$Anxiety_b$	F	5.437,	G	4.852	2.3698**
Boredom-$Anxiety_b$	F	5.524,	G	4.932	2.9830*
Boredom-$Anxiety_b$	G	4.932,	T	5.449	2.3995**
Centatt	F	7.161,	G	8.042	1.5764 n.s.
Autotelic	F	6.742,	L	7.911	2.9669*
Autotelic	F	6.742,	S	8.148	3.0366*

DF 6, 286
* Critical value of F at the .01 level = 2.80
** Critical value of F at the .05 level = 2.10
n.s. Not significant, highest Scheffé for a significant ANOVA

Key: B = baseball, F = Football, G = golf, L = lacrosse
S = softball, T = tennis, Tr = track

Table X

Significant Scheffé Tests Between Sport Means for Flow Experiential States and Flow Elements of Women Athletes

Flow Category	Sports and Means in Comparison	F
Nonflow	G 5.351, L 4.493	2.5456**
$Anxiety_w$	G 5.392, T 4.682	3.1605**
Boredom	G 4.761, T 5.527	3.1788**
$Anxiety_b$	G 4.819, T 5.389	3.0336**
Boredom-$Anxiety_b$	G 4.783, T 5.475	4.1535*
Control	G 8.434, L 7.525	3.1146**
Control	G 8.434, T 7.443	2.7395**
Clarity	G 6.355, S 7.375	2.2736 n.s.
Autotelic	G 7.329, L 8.148	3.9195**

DF 3, 119
* Critical value of F at the .01 level = 3.95
** Critical value of F at the .05 level = 2.68
n.s. Not significant, highest Scheffé for a significant ANOVA

Key: G = golf, L = lacrosse, S = softball, T = tennis

Table Y

Significant Scheffé Tests Between Sport Means for Flow Experiential States and Flow Elements of Men Athletes

Flow Category	Sports and Means in Comparison		F
Flow	B 7.705,	F 7.205	2.2302**
Worry	B 5.064,	G 5.791	2.6868**
$Anxiety_w$	F 5.634,	L 4.992	2.7316**
Worry-$Anxiety_w$	B 5.104,	G 5.661	2.4410**
Boredom	F 5.576,	Tr 4.991	2.7530**
$Anxiety_b$	F 5.437,	G 4.879	2.3431**
$Anxiety_b$	G 4.879,	L 5.437	2.2780**
Boredom $Anxiety_b$	F 5.524,	G 5.054	2.4848**
Boredom-$Anxiety_b$	F 5.524,	Tr 4.981	3.8892*
Boredom-$Anxiety_b$	L 5.493,	Tr 4.981	3.3479*
Centatt	B 8.089,	F 7.161	2.1676 n.s.
Lossego	B 7.375,	G 6.315	2.1329 n.s.
Autotelic	F 6.724,	Tr 7.855	2.9736**

DF 4, 137
* Critical value of F at the .01 level = 2.37
** Critical value of F at the .05 level = 3.32
n.s. Not significant, highest Scheffé for a significant ANOVA
Key: B = baseball, F = football, G = golf, L = lacrosse, Tr = track