Volume 8, 2
October 1995
A Subject and Author Index
of Dissertations and Theses
Including Abstracts.

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Microform Publications
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Microform Publications Bulletin

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- **RC** = Recreation and Leisure
- **HE** = Health Education
- **PSY** = Psychology
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PART I: TITLES AND ABSTRACTS

The abstracts are reproduced as provided by the authors in their dissertations. They were not edited for uniformity of style.

PHYSICAL EDUCATION

ADMINISTRATION

Forman, Brian. Factors of hiring head coaches in collegiate athletics, 1995. M.A., Ball State University (John E. Reno). (43pp 1f $4.00) PE 3556

INTRODUCTION: Today’s job market is extremely competitive. Having the basic job qualifications for a specific opening usually is not enough to gain a position. Getting a job can be as lucky as being in the right place at the right time, or as simple as who you know. For those who do not have the luck to be in the right place, and have not had the opportunity to know the right person; finding a job is both difficult and frustrating. The collegiate coaching profession is no different in that aspect. What goes through a collegiate athletic directors mind when they choose the person to build or maintain a program? That is the question every aspiring coach wants answered.

PURPOSE: The purpose of the study was to help people earn jobs in the collegiate coaching profession by determining what collegiate athletic directors deem the most important qualities of candidates. SIGNIFICANCE: The results of this study provided useful information to aspiring collegiate athletics coaches in their search for employment in the coaching profession. METHOD: Two hundred one college athletic directors were chosen randomly. There were eighty-two chosen from NCAA Divisions I, fifty-one from NCAA Division II, and sixty-eight from NCAA Division III. The instrument was a survey questionnaire with twenty five common factors in hiring coaches. They were asked to rank the top fifteen factors from one to fifteen with one being the most important and fifteen the least important of the ranked factors. Additional comments were encouraged. A cover letter that explained the purpose and benefits of the study accompanied the survey. The data were evaluated by adding the numbers of a given factor. The lowest number determined the most important factor, on average. Any strong or recurring comments were examined.

Smolianov, Peter. An investigation of sports marketing contingency competencies, 1994. M.S., Brigham Young University (Barbara Day Lockhart). (135pp 2f $8.00) PE 3572

This research examined 38 sports marketing competencies considered by 103 professionals to be important for sports marketing administrators. Using a Likert scale, the survey revealed 11 essential sports marketing competencies. Investigated were the sources through which the competencies were acquired. The competencies were mostly gained on the job (52.2%). A two-choice scale indicated which competencies were performed by the marketers and which competencies were delegated. The respondents delegated 37% of their competencies. Demographic data included administrators’ involvement in sports, education, age, gender, income, years in sports marketing, and number of employees in their organizations. Over 70% of the marketers were sports competitors. Data were analyzed for four segments: sports marketing firms, amateur sports organizations, professional sports organizations, and college athletics. Respondents’ opinions about most effective sports promotions and the criteria for evaluating sports promotions were examined. Future growth of sports marketing was predicted by 60% of the respondents.

The purpose of this study was to describe and analyze the factors intercollegiate athletic directors at Division I-A institutions perceive as most important when deciding to reduce financial support to one or more varsity sports in their program. In addition, the study attempted to determine any geographic regional differences on these factors. The subjects for this questionnaire were the athletic directors of the population of NCAA Division I-A institutions (N=106). The questionnaire asked each athletic director to indicate the importance (on a 7-point scale) each of 59 possible criterion items had over the cutback decision-making process. Accordingly, the 59 items were grouped into three broad categories, namely “Financial” (n=19); “Organizational” (n=20); and “Sport-Related” (n=19), based on the subjective judgment of the investigator and the thesis adviser. A total of 79 responses, representing 74.53% of the total population, were used. Factor analysis reduced the 59 items to the following eight factors: Operating Costs; Revenue Sources; Executive Views; Constituent Influences; Athletic Department Image; Competitive Opportunity; Team Success; and Spectator Appeal. Repeated measures analysis of variance, followed by Tukey’s critical difference post hoc test, were computed on the factor means to determine if any differences existed among the components and whether the differences were significant. Within the limitations of the study, the following conclusions seem justified: 1. Athletic directors at NCAA Division I-A schools perceive the most important factors in determining cuts are Executive Views, Athletic Department Image, and Spectator Appeal. 2. Factors commonly associated as being important, such as Revenue Sources and Constituent Views, while noted as important, were not among the most important factors. 3. Intangible factors like Athletic Department Image were perceived to be more important than tangible factors like Operating Costs, Revenue Sources, and Team Success. 4. The findings did not differ significantly among NCAA geographic regions. 5. A majority of intercollegiate athletic programs either have a plan for cutbacks (48%) or expect to have one in the near future (11%).

**PEDAGOGY**

LeBoeuf, Maureen K. *Effectiveness of the physical education curriculum at the United States Military Academy in preparing its women graduates*, 1994. Ed.D., University of Georgia (Ann E. Jewett). (258pp 3f $12.00) PE 3561

Understanding the participant perspective of a program is important in order to determine if the curriculum is in fact achieving the desired outcomes. The purpose of the study was to examine the effectiveness of the physical education curriculum of the United States Military Academy in the preparation of its women graduates for their role as Army officers and leaders. This study focused on the perceptions of women graduates concerning the physical education curriculum and related experiences. To provide a context for this study an extensive review of the literature centered around the changes which have been implemented at the United States Military Academy within the Department of Physical Education since the arrival of women in 1976. Participants were 181 women graduates of the United States Military Academy from the classes of 1980, 1985, and 1990. Data were collected using a survey questionnaire which centered around the operational definition of effectiveness. In this study effectiveness was defined as an evaluation of the extent to which the individual participant derived satisfaction from the physical education program, acquired fitness knowledge and skills, adopted a pattern of regular participation in fitness activities, and ultimately, observed a beneficial impact on the unit to which the individual is assigned. Follow-up telephone interviews were conducted with 13 women graduates in an attempt to probe for additional information in areas identified during the data analysis. Content analysis was used to determine the categories which were most prevalent in the data. The categories which emerged for the classes include: increased self-confidence, hard work and discipline; excelling physically; credibility; being a role model; benefits of fitness; teaching; and increased self-esteem. It was determined that few changes have been made in the physical education curriculum since the admission of women in 1976. Additionally, the women have continued to meet and exceed the physical challenge presented; their upper limits have yet to be determined. In general, it was concluded that the physical education curriculum is an effective component of the United States Military Academy’s preparation of its women graduates to assume their role as Army officers and leaders. INDEX WORDS: Curriculum Evaluation, Physical Education Effectiveness, Impact Study, Participant Perception, United States Military Academy, United States Army Physical Fitness, Women in the Military, West Point Curriculum

Walker, David R. *Mastery standards for collegiate racquetball classes*, 1993. M.S., Brigham Young University (Philip E. Allsen). (91pp 1f $4.00) PE 3576

This study established skill mastery levels for players in beginning collegiate racquetball classes using two valid, reliable skills tests and determined that these mastery scores can predict success in intermediate racquetball classes. The Long Wall Volley Test (LWVT) and the Ceiling Shot Placement Test (CSPT) were administered to 348 beginning and 49 intermediate students. Mastery levels established by contrasting groups were 21 for the LWVT and 11 for the CSPT. Skills test classifications were criterion referenced with round robin tournament classifications, with C=.90 and .91 for the combined class on the two tests, respectively. Male coefficients were .73 and .74, and female coefficients were .75 and .73, respectively. Intermediate students were skills tested and then played a round robin
The effects of a coach accreditation program upon the perceived competence, level of knowledge and status of coaches in Hong Kong, 1993. Ph.D., University of Oregon (Lois J. Youngen). (259pp 3f $12.00) PE 3578

The major purpose of the study was to assess the effects of participation in sports-general theory courses of the Hong Kong Coach Accreditation Program upon the perceived competence, level of knowledge and status of coaches in selected sports in Hong Kong. One hundred and sixty-four coaches participated as subjects in the study and attended Hong Kong Coach Accreditation Program Level 1 and/or Level 2 sports-general theory courses between 1 January and 30 September 1992. Each subject completed Questionnaire A(QA) at the beginning of his/her first course during this period. An identical questionnaire (QB) was completed in January 1993. Each subject was assigned to an attendance classification on the basis of the sequence in which he/she completed QA, participated in the Level 1 and/or Level 2 sports-general theory course and completed QB. Each subject was also assigned to a Part-Time, Club or Regional/ National coaching level on the basis of his/her current level of coaching. Means and QA-QB percentage gains/losses were computed for the final sample, attendance classifications and coaching levels for perceived competence, level of knowledge and status. Coaches who attended both Level 1 and Level 2 courses and those who were coaching regional or national squads appeared to gain the major benefit from participating in the sports-general theory courses. The “Injury Prevention and Care” coaching competency and “Legal Aspects of Coaching” subject area resulted in the largest percentage gains. However, the data indicated that participation had a minimal effect on perceived status. The Hong Kong Coach Accreditation Program appeared to have a positive effect on the number of registered accredited coaches. There was also some evidence that the Program was assimilated into the sporting infrastructure of Hong Kong. Finally, the Continuing Coach Education Program appeared to have a positive effect on the number of coaches participating in continuing coach education.

Chinese dance is a unique form of dance, having exquisite style and subtle metre, and requiring substantial skill. Three important categories of basic movement in Chinese dance that display this unique form are the FAN SHEN, Pose Turn, and Traveling Jump categories. This thesis analyzes one movement from each of these three categories, namely, XI TUI FAN SHEN, XIE TAN HAI ZHUAN, and DA SHE YAN TIAO. The main purpose of this study is to make science serve dance more directly. Through physics analysis, this study finds the mistakes and/or insufficiencies in the traditional instructions for doing these three movements. Then, this study improves the traditional instructions, and gives the scientific teaching methods which can be directly used in dance teaching to save dancers’ bodies and training time. All other movements in the FAN SHEN, Pose Turn, and Traveling Jump categories can be analyzed in ways similar to those which are described in this thesis.

Relations among selected kinetic and kinematic parameters of three types of dance leaps, 1995. Ph.D., Temple University (Marjorie G. Owen). (123pp 2f $8.00) PE 3564

The purpose of this study was to examine selected biomechanical variables for: (a) the stag leap, (b) the grand jété, and (c) the jazz leap. The biomechanical parameters studied were: (a) take-off angle and velocity; (b) depth and time of the plié preparation; (c) magnitude and angle of application of ground reaction force; (d) joint range of motion and peak angular velocity for the hip, knee, and ankle of the take-off leg; and (e) the range, maximum
height, and time in the air of the leap. Parameters were investigated by videotaping (Motion Analysis System) and collecting force platform (Bertec) records for subjects executing five trials of each leap. A univariate repeated measures analysis of variance (p<.01) was used to analyze the variability of the biomechanical parameters among leaps. Where indicated, Scheffé posthoc tests were used to determine the nature of the differences. Among the leaps, no significant differences were found in take-off velocity, angle of take-off, depth and time of the plié preparation, magnitude and angle of application of ground reaction force, range of motion for the hip, knee, and ankle joints of the take-off leg, hip peak angular velocity, ankle peak angular velocity, and range. The knee peak angular velocity for the stag leap and the grand jété were significantly greater than the jazz leap. The jazz leap had significantly greater maximum height than the grand jété. The stag leap had significantly greater time in the air than the grand jété and the jazz leap. The Pearson product-moment correlation was used to examine the relationships between plié depth and type of leap, plié time and type of leap, magnitude of ground reaction force and type of leap, and angle of take-off and angle of application of ground reaction force. A two-tailed t-test was used to examine the significance of the difference among the relationships. No significant relationships were found, and no significant differences were found between the relationships.

**SPORT HISTORY AND PHILOSOPHY**


This study of the imagery of boxing discusses boxing as a phenomenon within the social and cultural environment of the English people during two time periods, from approximately 1730 to 1750 and from 1783 to 1824. The results change the common perception that British sporting art consisted first and foremost of field-sport images. In fact, an iconography of boxing exists, which indicates that the boxing image was also an important part of the genre. The study incorporates a representative selection of images, among them genre paintings, moralistic subjects, portraits, and popular works, and includes relevant sport-historical literature. It begins with an investigation on the nature of sporting art and its related ideals. An inquiry into early boxing history leads into the discussion of boxing art. The first signs of a pictorial tradition of boxing imagery appeared in the early eighteenth century. William Hogarth’s representations of boxing from the 1730s to 1752 explore the social context of boxing and show how the pugilist of this period attracted aristocratic patronage, while remaining visibly connected with lower-class life. In the late eighteenth century boxing art was affected by the pugilists’ aspirations to become integral members of the sporting life of upper-class male society. To suppress boxing’s stigma of brutality, the sport was detached from unpleasant notions, and, instead, romanticized and associated with traditional concepts of gentility. The study discusses boxer portraits, which represent the pugilists in rural landscape settings and emphasize the nonviolent display of manly beauty. Another issue is the idealization of boxing through the use of antique allusions. When in the early nineteenth century boxing appeared in popular art the concern was with unaffected reality. A discussion of caricature and illustrations discloses an enrichment of the genre through concepts of actuality, motion, and spontaneity. Yet, this popular representation of boxing eventually clashed with a changing public opinion and finally contributed to the decline of pugilism and its representation in art. This thesis’ contribution is that it enlarges the scope of British sporting art beyond field sports. It concludes that boxing art deserves consideration as an important part of the genre.

Mason, Daniel S. *The origins and development of the International Hockey League and its effects on the sport of professional ice hockey in North America*, 1994. M.A., University of British Columbia (P. Barbara Schrodt). (352pp 4f $16.00) PE 3563

This study examined the development of the first professional ice hockey league, the International Hockey League, and its relationships with amateur and professional leagues and ideals, in both Canada and the United States, during the first decade of the twentieth century. Following the historical method, relying primarily on newspapers reports from the towns involved with the League during that period, a chronological-thematic narrative was written to analyze the following hypotheses: a) the League played an important role in the development of professional hockey in Canada, b) the League and its members reflected and affected attitudes toward professional hockey in Canada and the U.S., c) the operations and play levels of the League were the direct result of several influential individuals and events. The study was arranged into three distinct parts: an examination of background conditions existing in eastern Canada and ice hockey prior to the formation of the I.H.L.; a descriptive narrative of the I.H.L.’s towns, operations and influential individuals; and an interpretation of selected issues. The study revealed that the formation and operations of the I.H.L. provided a significant influence on the trend toward the acceptance of professionalism in the Canadian senior hockey leagues. It was also determined that the factors associated with that acceptance led to the demise of the I.H.L.

Professional soccer was the top professional sport in many of the other major countries of the world during the 1980s and 1990s. Such was not the case in the United States as professional soccer had yet to establish a significant, ongoing professional league of any serious stature. This research effort appeared to be warranted given the fact that United States officials had hosted the most successful World Cup and assured Federacion Internacional de Football Association that they would establish a major professional soccer league as a condition of having been awarded the World Cup. This historical analysis addressed the four major attempts to establish professional soccer in the United States in an effort to determine where those respective leagues failed based on the available data analyzed against an ideal-type formula for success. A review of the literature revealed that little research existed that analyzed systematically past major attempts to establish professional soccer in the United States. This study was devised to formulate a framework for an ideal-type formula for the successful establishment of professional soccer in the United States. The hypothesis of this study was that the failure of the four major attempts to establish professional soccer in the United States between 1894 and 1994 was associated with the leagues’ failures to meet all the elements of an ideal type formula for success. The hypothesis was tested by the development of an ideal-type formula for success, which was developed by a panel of nine professional sports experts using a modified Delphi Technique. The historical record was analyzed, and the researcher passed a judgment for each of the four past professional soccer leagues against each of the ten elements of the formula. The researcher’s findings were verified by two groups of judges, three soccer historians and three past professional soccer team owners. The hypothesis of study was accepted as the findings of both the researcher and the two groups of judges confirmed that the failure of the four major attempts to establish professional soccer in the United States was associated with the leagues’ failures to meet all the elements of an ideal-type formula for success.

**SOCIOLGY AND CULTURAL ANTHROPOLOGY**


Professional football (American football in the USA, and soccer in England) has grown in popularity in both the USA and England over the past century. Both sports saw their inception in the nineteenth century yet were not accepted at the pro level by the public and press, as a serious, worthwhile enterprise, until the twentieth century. However, once recognition occurred the professional game evolved into a commercialized, spectator sport. Besides the obvious differences between American football and soccer, cultural disparities are a factor in producing dichotomies between each sport, however, similarities do exists. Therefore, this study examines both similarities and differences in terms of structure, the way the game has been played, organized and developed, and the meaning it brings to sport and the culture.

**BIOMECHANICS**

Amoroso, Annita T. *The influence of bicycle seat height on the mechanical function of the human gastrocnemius [i.e. gastrocnemius], soleus, and tibialis anterior muscles during steady-rate cycling*, 1994. M.S., University of British Columbia (David Sanderson). (107pp 2f $8.00) PE 3546

Cycling has become a popular model in recent years for the study of muscle mechanics. The purpose of this study was to manipulate bicycle seat heights in order to perturbate muscle lengths and contraction velocities of three lower leg muscles, the soleus, medial gastrocnemius, and tibialis anterior, and to measure subsequently the effects on the muscles’ contribution to the cycling task as measured by EMG. Two groups of female subjects, riders (n=7) and non-riders (n=6), rode a bicycle mounted on a Schwinn Velodyne(R)) at 200 Watts and cadence of 80 rpm. Individuals rode at a self-selected seat height, a 10% lowered, and 5 % raised seat position. It was hypothesized that responses in muscle EMG would differ on the basis of cycling experience but results showed this to not be true. It was also hypothesized that because the three muscles would operate at decreased contraction velocities at the low seat, the integrated EMG would be less for the lowest seat position. This hypothesis was based on the force-velocity relationship of muscle, where muscles operating at the lower end of the velocity spectrum can produce greater forces and thereby require the recruitment of fewer fibers to perform the same task. Although the soleus and medial gastrocnemius muscles did show a decrease in integrated EMG value with decreases in seat height, the tibialis anterior showed unexpected results, with the chosen seat height resulting in the lowest integrated EMG. This suggests either that EMG responses occurred independently from the calculated muscle lengths and contraction velocities or that electromyography may not be a sensitive enough tool to reflect changes in muscle force induced by altered muscle lengths and/or contraction velocities. As seat height decreased, it was also observed that the absolute muscle lengths increased for both the soleus and medial gastrocnemius muscles, but decreased for the tibialis anterior muscles. The absolute peak muscle lengths did not show a large variation across seat heights, with only an average difference of 2%. Therefore, it is unlikely
that the changes in muscle lengths affected the force production of the muscles to a significant extent. Although the muscle length and contraction velocity variables add considerably more insight into the mechanics of muscle action than either EMG or kinematic analyses of limb motion alone, their use in predicting muscle forces and muscular contributions to movement remains very limited. Furthermore, the choice of using the cycling model for investigating certain aspects of muscle mechanics should be examined further.

Black, Alexander H. The effect of steady rate exercise on the pattern of force production of the lower limbs in cycling, 1994. M.S., University of British Columbia (David Sanderson). (85pp 1f $4.00) PE 3548

The role of fatigue in the cessation of activity has been studied extensively and reported in the physiology literature. Biomechanical compensations that occur as a result of fatigue, however, have had little focus in the scientific literature. Data have been published (Black et al. 1992 and Amoroso et al., 1993) that suggest there are biomechanical compensations that occur just prior to the cessation of activity as a result of the fatigue process in cycling. These compensations include increases in the index of effectiveness, earlier maximum force production in the pedal cycle, and increased dorsiflexion at the ankle. These changes suggest that there are compensations by the muscles in response to the onset of whole body fatigue. The purpose of the present investigation was to quantify the biomechanical changes that result from the progressive onset of fatigue in cycling. The criterion measurements included timings of maximum joint angle excursions, timings of maximum force production and timings of maximum joint moments at the ankle, knee and hip. Male cyclists (n=12) completed a progressive, incremental maximal exercise test at 90 RPM on a bicycle ergometer to determine maximum power outputs. Two steady rate, constant power output rides followed: one at 80% max P.O. to exhaustion, and one at 30% max P.O., for the same length of time as the 80% max P.O. ride. Force data were collected from the right pedal of an instrumented bicycle for 3 pedal cycles at the end of each minute of the steady rate exercise tests. Kinematic data were recorded ongoing throughout the steady rate exercise test. Kinematic and kinetic data for the initial and final minutes of both steady state rides were then time matched and joint moments for the ankle, knee and hip were calculated using the inverse dynamics approach. There were significant differences between the initial and final minutes of the study. These changes included earlier maximum hip extensor moment, greater ankle plantar flexor moment, increased knee flexor moment and increased hip extensor moment (p<0.05). These increased joint moments summed to produce a significantly larger propulsive moment in the final minute of the exercise (p<0.05). These changes were results of changes in the kinematic data and the kinetic data that were the result of fatigue. Based on the results of this study, it was concluded that the increase in the propulsive moment was necessary to overcome a decrease in the index of effectiveness (p<0.05), which was a product of whole body fatigue. The increase in the propulsive moment was a result of increases in the maximum joint moments at each of the lower limb joints. In summary, as the results of fatigue affect an athlete, the athlete is forced to change the strategy of muscle recruitment which is used to overcome the given power output in order postpone the cessation of exercise.

Chae, Woen-Sik EMG activity and kinematics of cycling movements at different pedal shaft widths, 1995. M.S., Ball State University (Gale Gehlsen). (110pp 2f $8.00) PE 3550

The purpose of this study was to quantify the EMG activity of selected lower limb muscles during cycling, and to define the relationship between pedal shaft width and muscular involvement. This study has particular significance to the female cyclist who by virtue of pelvic width may have a less efficient pedaling force, or an imbalance of applied muscular force. Variables analyzed were hip, knee, ankle range of motion(ROM), biceps femoris (BF), vastus lateralis (VL), rectus femoris (RF), and vastus medialis (VMO) muscle activity. Significant differences among three different pedal shaft widths were determined through use of repeated measures one way ANOVA, Newman-Keuls post hoc test. The hip ROM, biceps femoris, and vastus medialis EMG activity results of the present study appeared to indicate that different pedal shaft widths had an effect on changes in the ROM and EMG activity. This study indicated that the hip ROM values increased with an increase in the pedal shaft width. In contrary, an increase in pedal shaft width significantly decreased the muscle activity in the vastus medialis while two inch pedal shaft width significantly decreased the muscle activity in the biceps femoris.

Champer, Jerry A. Forward velocity in relation to a specific timing sequence in butterfly swimming, 1994. M.S., University of Wisconsin-La Crosse (Richard L. Pein). (54pp 1f $4.00) PE 3551

Six female and 5 male subjects performed a maximal effort 100 yd. butterfly time trial. The purpose of the test was to investigate if there was a link between the swimmer’s forward velocity and the amount of time between the end of the downward portion of the first kick and the finish of the outswep of the hands. Subjects were filmed underwater from the front in order to best show the movements of interest. The sequence was then analyzed on a stop action/ single frame advance VHS player. A constant frame speed of 30 frames per second was utilized. No statistical difference was found in the comparison between the timing pattern and velocity. Other comparisons between the change in the subject’s 2nd and 4th length were
Studies have shown significant correlations between ulceration and high pressure areas on the foot, however, few studies have quantified plantar pressure patterns for normal walking. There is no normative data nor is there a standardized variable set for describing plantar pressure patterns. The purpose of the study was to quantify in-shoe plantar pressure patterns during walking and provide an initial database and variable set for use in both clinical and research environments. Thirty males free of lower extremity deformity volunteered as subjects. The FScan Insole System (Tekscan, Boston, MA) was used to collect foot pressure data during walking (100 Hz) simultaneously with ground reaction force (GRF) data (AMTI, 500 Hz) for the purpose of calibration validation. A total of five steps of data per subject was collected. The FScan data were evaluated using a custom foot pressure analysis software package. One hundred and twenty-five variables were identified and used to develop a database describing normal plantar pressure walking patterns. The GRF results showed no statistical differences between the FScan and force platform (FP) magnitude data, however, the FScan data exhibited a slight temporal shift for the first maximum and minimum forces. Correlation coefficients between corresponding points on the two curves showed lesser values at initial contact and prior to toe-off due primarily to foot sensor orientation relative to the walking surface. The data analysis indicated that plantar pressure patterns could be effectively quantified using the identified variable set but that caution must be exercised due to the strengths and weaknesses associated with different variables. The ratio variables are very sensitive measures but are prone to error. The summation variables are more reliable and comparable to the measures from the FP system. The timing variables provide useful timing pattern information. The variables from the 12-area foot model appear to be valuable clinical tools for diagnosing foot disorders. Continuous measures are recommended since they provide both spatial and temporal information over the entire support phase and are easy to visualize relative to function. Quantification of the variables provided a normal database for future use in the diagnosis and evaluation of foot disorders.

Chen, Fang C. A study of normal plantar pressure pattern of the foot during the support phase of walking, 1994. Ph.D., University of Oregon (Barry T. Bates). (159pp 2f $8.00) PE 3552

Variability inherent to human motion and is the product of the interaction of the neural, muscular and skeletal systems with the physical surround. Three sources of variability (random error, systemic error, and motor program) were postulated and modeled using experimental and stochastic mathematical techniques. The outputs from the models (systems of time normalized torque curves) served as inputs into a differential equation computer simulation landing (DECSL) model producing kinematic and ground reaction force (GRF) data. An initial investigation (4 subjects, 4 conditions) utilizing the developed simulation tools was conducted. Two simulation conditions (random error and systemic error) and two experimental conditions (no load, added load, 2 subjects 1000 g., 2 subjects 2000 g.) of 25 trials were generated. Four male volunteers performed landings (60 cm. from hanging position) onto an AMTI force platform (2 footed landing, 1 foot on platform, 1000 Hz.) while simultaneous sagittal kinematics were recorded (Motion Analysis, 200 Hz). Joint torques and powers were calculated from the kinematic (5th metatarsal, calcaneous, malleolus, knee, hip and rib) and the ground reaction force data (Fx, Fy, Fz, Mx, and My). The simulation conditions assigned observed variance from the no load experimental condition to either random error (no mechanical propagation of stochastically induced error) or to systemic error (mechanical propagation of induced error). Within subject comparisons of no load versus load, no load versus random error (RE), and no load versus systemic error (SE) were conducted. Two types of analysis were performed using Model Statistics; 1) point by point curve comparisons (torque and power curves), and 2) discrete point analysis (F1, T1, F2, T2). Initial results support a motor program origin for normal movement variability. Preliminary experimentation with DECSL parameters suggests that tolerance to neural to velocity dependent damping. The results of this investigation indicate that more information on the energetics of landing is needed and that simulation techniques can provide useful insights into movement problem that can not be addressed by experimental methods alone.

Johnson, Douglas L. Power output prediction determined from vertical jump and reach test for male and female university athletes, 1994. M.S., Ball State University (Rafael E. Bahamonde). (81pp 1f $4.00) PE 3559

The purpose of this study was to devise a simple mechanical power formula for both peak and average power using a counter movement jump and reach test for both college male and female athletes. Forty-nine female and 69 male athletes were measured for height, weight, thigh circumference, thigh skinfold, upper leg length, and lower leg length. The athletes performed a counter movement jump
and reach test off of a force platform. A Vertec jumping apparatus was used to measure vertical jump height and the force platform was used to acquire force/time data to determine actual peak and average power output. Eight anthropometric measurements, vertical jump height, and gender were the variables presented to develop the equations. A stepwise multiple regression statistical procedure was used to develop the prediction equations. Vertical jump height, mass, and body height were the significant (p<.05) variables loaded into both peak and average mechanical power prediction equations. Gender was not significant (p>.05) and, therefore, not loaded into either equation. Predicted peak power and actual peak power values were 4,707±1,511 and 4,687±1,612 watts, respectively. Predicted average power and actual average power values were 2,547±760 and 2,463±753 watts, respectively. The following best model regression-derived equations produced R² values of .91 for peak power and .82 for average power: Peak Power (W)=78.47 · VJ (cm)+60.57 · Mass (kg)+15.31 · Ht (cm)+1,308 Average Power (W)=41.41 · VJ (cm)+31.18 · Mass (kg)+13.86 · Ht (cm)+431. Results of this study conclude that the two regression equations are good predictors of peak and average mechanical power output.

King, Michael J. Wrist motion comparison of supermarket barcode scanners for potential Carpal Tunnel syndrome risk, 1995. M.S., University of Oregon (Janet S. Dufek). (120pp 2f $8.00) PE 3560

This study attempted to compare the Carpal Tunnel Syndrome (CTS) risk associated with the use of three supermarket barcode scanners, two new designs and one old. Mean wrist angular acceleration (MWAA) values (Marras and Schoenmarklin, 1993) were measured using a two camera, three-dimensional video based methodology. Each subject’s (N=10) MWAA values were calculated for four standard supermarket items. The results indicated no significant differences between the scanners for 75% of the items. For one item (box), significantly higher MWAA values (hypothesized increased CTS risk) were measured with the use of the old scanner design than for either of the new scanner designs. The results indicated that MWAA may not be an effective parameter for differentiating CTS risk between some working environments and that the MWAA values experienced by the supermarket checkers may be higher than those previously reported (Marras, Greenspan, & Schoenmarklin, in press).

Upshaw, Kris. The effects of stroke rate and stroke length on upper quadrant stroke patterns in competitive swimming, 1995. M.S., Ball State University (Gale Gehlsen). (69pp 1f $4.00) PE 3575

The purpose of this study was to describe women collegiate swimmers’ armstroke sequence at selected velocities. In addition, this study was designed to determine the timing angle during the course of a stroke cycle. Seven members of the Ball State University Women’s Swim Team were asked to participate in this study. The test consisted of the subject swimming approximately fifteen meters freestyle (front crawl) at stroke rates of 24, 30, 40, 48, 60 strokes per minute. The subjects attempted three trials at each stroke rate, on a continuum from slow to fast. The following parameters were determined from video analysis: stroke length (SL), velocity (m/s), time of one complete stroke cycle (SCT), timing between the arm cycles (RAE), recovery arm entry as a percentage of SCT (RAEpct) and the timing angle. A correlation between the timing angle and V of r=0.48 was found to be significant at the 0.05 level. A correlation between the SCT and the timing angle of r=-0.62 was found to be significant at the 0.05 level. A correlation of r=-0.43 between SL and the timing angle was found to be significant at the 0.05 level. This indicates that as the swimmers’ SCT decreased, the timing angle increased. And, as the swimmers’ SL decreased the timing angle increased. It appears that timing angles increase with increasing V. The mean timing angle for ninety trials was 66.03 degrees with a SD of 17.68. This study indicates that women collegiate swimmers use a timing angle of less than 90 degrees. A timing angle of less than 90 degrees is believed to benefit the swimmers’ body position, balance and SL.

**SPORTS MEDICINE**

Bowman, Anita L. Utilization of support staff by athletic trainers at NCAA institutions, 1995. M.S., Ball State University (Michael S. Ferrara). (30pp 1f $4.00) PE 3549

There are many choices of specialists to be utilized in a sport medicine staff. The effectiveness of any athletic training program depends on the organization and utilization of these specialties. The purpose of this investigation was to review current practices of accessibility, utilization, and compensation of sports medicine support staff at NCAA Division I, II, III institutions. A random sample of 225 NCAA institutions equally stratified by level (Division I, II, II) was obtained from the National Association of Collegiate Directors of Athletics (NACDA) directory. A questionnaire was sent to 75 head athletic trainers in each of three NCAA divisions levels. Of the 225 questionnaires mailed, 178 were returned representing a 79% response rate. The accessibility and utilization of support staff was equally distributed with respect to gender and sports at all division levels. When examining the support staff, Division I had consistently higher accessibility and utilization rates than Division II and III. This study may assist athletic trainers to evaluate or update their program by reviewing current practices of accessibility utilization, and compensation of support staff.
Falkenberg, Kirsten M. Bioelectrical impedance analysis: the effect of hydration level on body composition, 1995. M.S., Purdue University (Roseann M. Lyle). (113pp 2f $8.00) PE 3555

The purpose of this study was to determine the effect of hydration level on body composition (BC) measurements using bioelectrical impedance analysis (BIA). A two-day dehydration-rehydration protocol was employed to induce changes of approximately 2% body weight in subjects. Measurements of weight, urine specific gravity, and BC by BIA were taken over two consecutive days in three hydration states: baseline/euhydration, dehydration, and rehydration. Following baseline measurements in an euhydrated state, thirty-two subjects (12 males and 20 females; mean age, 26.3 years) were dehydrated over a 24-hour period with no fluid intake. Rehydration measurements were taken after a two-hour period of ingesting water to replace the weight lost with dehydration. At baseline, a one-way ANOVA demonstrated that the males were taller and heavier, had lower fat mass and percent body fat, and greater amounts of body water and lean mass than the females. These differences between genders remained in the dehydrated and rehydrated states. Changes in urine specific gravity confirmed that changes in hydration status occurred during the dehydration-rehydration period. A repeated measures ANOVA revealed a significant decrease in weight in both sexes with dehydration, and a significant decrease in lean mass only in the males. Estimates of TBW, fat mass, and percent fat did not change significantly. Since the males and females responded similarly to the protocol, data for the combined sample were analyzed. Results were similar, with TBW reaching significance as well. Although weight increased significantly after rehydration, BIA was unable to detect consistent changes in BC in the rehydrated state. Between baseline and dehydration, and between dehydration and rehydration, changes in TBW and lean mass were positively correlated with changes in weight. Changes in weight were not correlated with changes in fat mass. In conclusion, results of this study suggest that BIA measurements taken in a state of 1-2% dehydration, and subsequent rehydration, did not significantly affect percent body fat estimates in this sample. Use of standard testing protocols and population specific prediction equations will improve the reliability of body composition assessed by BIA.


The purpose of this study was to examine the effects of various treatment techniques on the symptoms of delayed onset muscle soreness (DOMS). Subjects were 70 untrained volunteers 21 to 40 years old. DOMS was induced via 15 sets of 15 eccentric contractions of the forearm extensor muscles on the Lido isokinetic dynamometer. A pilot exercise bout was performed a minimum of 9 weeks prior to data collection to assure the production of DOMS. Baseline data included the following 15 dependent variables: active wrist flexion and extension, passive wrist flexion and extension, forearm girth, limb volume, Visual Analogue Scale, Muscle Soreness Index, isometric strength, concentric and eccentric wrist total work, concentric and eccentric wrist average peak torque, and concentric and eccentric angle of peak torque. Subjects then repeated the exercise bout and dependent variables were reassessed. Subjects were randomly assigned to 1 of 7 groups (6 treatment and 1 control). Treatments included an anti-inflammatory drug (NSAID), high velocity concentric muscle contractions on an upper extremity ergometer, ice massage, 10-minute static stretching, topical Arnica montana ointment, and sublingual Arnica montana pellets. Baseline assessments were repeated immediately after treatment and 24, 48, and 72 hours posttreatment. A 7 x 6 analysis of variance with repeated measures on time was performed on each of the 15 dependent variables. Significant (p<.05) main effects were found for all of the dependent variables on time only. Newman-Keuls post-hoc tests revealed no significant differences between the various treatments for any of the dependent variables. Although not significant, the NSAID and Arnica montana treatments appeared to impede recovery of muscle function. The upper extremity ergometer treatment failed to significantly reduce edema or decrease muscle soreness. The ice massage treatment appeared to influence acute muscle soreness but was not effective in abating DOMS. The static stretching treatment initially increased range of motion but did not significantly influence muscle soreness or muscle function. Therefore, none of the modalities employed in this study significantly abated the symptoms of DOMS.


This study describes the practices and perceptions of personal trainers in the following areas: assessing clients, prescribing exercise, motivating and monitoring exercise programs, and qualifications for becoming a personal trainer. The clients’ perceptions of the need for personal trainers, as well as their expectations are also described. The data for this study were collected using qualitative methods: formal and informal interviews, non-participant observations, fieldnotes, and document analysis. The content of the exercise programs was analyzed and compared to the recommended practices found in the literature. A cross-case analysis was used to compare the similarities and differences among cases. The four cases studied were presented in a case study format. The findings indicated a need for prior knowledge in the science of exercise, i.e., anatomy, physiology, kinesiology, prior to becoming a personal trainer; trainers adhered to
the recommended guidelines for testing and prescribing exercise programs for clients; program designs were individualized (to a point); trainers prescribed three components of physical fitness for clients, i.e., cardiovascular, strength, flexibility, yet, the primary focus of all training sessions was strength training. The need for added motivation and the lack of self discipline was one of the primary reasons why individuals hire personal trainers. My personal vision of fitness training, and suggestions for future research are included.

Rimington, Stephanie J. The influence of therapeutic ultrasound on temperature rise in the precooled gastrocnemius muscle on humans, 1993. M.S., Brigham Young University (David O. Draper). (61pp If $4.00) PE 3567

Therapeutic ultrasound is frequently employed as a deep heating rehabilitation modality. It is administered in one of three ways: ultrasound with no preceding treatment, on preheated tissues, or on precooled tissues. The purpose of this study was to investigate the effect ultrasound treatments had on the tissue temperature rise (TTR) on the precooled human gastrocnemius muscle. Sixteen male subjects had a 23 gauge hypodermic needle microprobe inserted 3 cm deep into the medial aspect of the anestheitized gastrocnemius muscle. Data was gathered on each subject for one of two randomly assigned treatments: (a) ultrasound treatment on precooled tissue; or (b) ultrasound with no preceding treatment. Each treatment consisted of ultrasound delivered topically at 1.5 watts/cm² in a continuous mode for 10 minutes, with temperature readings recorded at 30 second intervals. A significant difference was found between the two treatment methods ($t[14]=16.26$, $p<0.01$). Therefore according to our data, at a depth of 3 cm, ultrasound alone is better thermal modality than ultrasound preceded by an ice treatment.

Serrano, Ramon R.R. Development of regression equations to predict body density in obese non diabetics and obese Type II diabetic adults, 1994. Ph.D., Indiana University (Janet P. Wallace). (130pp If $8.00) PE 3568

Two hundred and six obese subjects participated in this study. They were assigned to four groups. Fifty men were assigned to the obese non-diabetic men group. Fifty women were assigned to the obese non-diabetic women group. Forty one men were assigned to the obese Type II diabetic men group and sixty five women to the obese Type II diabetic women group. Five body girths and body density determined by the hydrostatic weighing technique were obtained in all the subjects. The body girths obtained were mesosternale, abdomen 1, abdomen 2, gluteal and thigh. Waist-hip ratio was calculated in all subjects by dividing abdomen 1 girth by gluteal girth. Regression analyses were performed using body density determined by hydrostatic weighing technique as the dependent variable and waist-hip ratio, mesosternale girth, abdomen 1 girth, abdomen 2 girth and thigh girth as the independent variables. Results indicated that the independent variables were significantly correlated with body density in the obese non-diabetic men, obese Type II diabetic women group and obese Type II diabetic women group. A multiple regression equation was developed for each of these groups with multiple Rs of 0.70878, 0.092755 and 0.62576 respectively. The regression equations developed for the obese Type II diabetic men and obese Type II women group were cross validated with a sample of 50% of the original sample picked at random. Results indicated that the means of the body density obtained using the regression equations were not different from the means of the body density determined by the hydrostatic weighing technique. These findings indicate that these regression equations can predict accurately body density in the respective populations.

Shelly, Jennifer. Effect of two ultrasound machines and angles of application on tissue mimicking material, 1995. M.Ed., Temple University (Iris F. Kimura). (105pp If $8.00) PE 3569

The purpose of this study was to investigate the effects two ultrasound machines (EXCEL UltraMax and Mettler Sonicator 720 ultrasound machines) with different methods of calculating dose had on the tissue mimicking material temperature. The independent variables in this study were the ultrasound machines, angle of application, and treatment time while the dependent variable measured was temperature. Each angle of application was assessed during four data collection trials. At least one hour separated each treatment to allow the temperature of the tissue mimicking material to return to baseline. A 2 x 4 x 5 analysis of variance (ANOVA) with repeated measures at the .05 significance level was used on the temperature data to determine the effect ultrasound machine, angle of application, and time had on tissue mimicking material temperature (Dixon, 1992). The F values indicated a significant interaction between ultrasound machine and treatment time, and angle of application and treatment time. Subsequent tests for simple effects (Hotelling’s t-squared statistic) at the .05 significance level indicated significant differences within tests for the EXCEL UltraMax and Mettler Sonicator 720 ultrasound machines, treatment times at 80 and 60 degree angles of application (Dixon). Pairwise t-tests were performed with the p level adjusted via Bonferroni technique to determine where differences occurred within tests. Results indicated significant differences between treatment times 1 and 5 with the EXCEL UltraMax ultrasound machine and between treatment time 1 as compared to treatment times 4 and 5, and between treatment times 2 and 5 with the Mettler Sonicator 720 ultrasound machine. Significant differences were also found during treatment times 2, 3, 4, and 5, within tests at.
the 90 degree angle of application as compared to the 60 degree angle of application and between treatment times 1 and 5 at the 90 degree angle of application. It was concluded that ultrasound machine, angle of application, and treatment time in this study significantly affected the temperature of the tissue mimicking material. The transmission of ultrasound energy was dependent upon ultrasound machine. Therefore, the same ultrasound machine should be used from treatment to treatment. However, caution should be taken when applying these results to human subjects.

Smith, Kevin L. The effects of a hot pack treatment on muscle tissue temperature, 1994. M.S., Brigham Young University (Earlene Durrant). (75pp 1f $4.00) PE 3570

Hot packs are among the most commonly used therapeutic modalities in sports medicine. The purpose of this study was to investigate the effects of a hot pack treatment on the temperature of the triceps surae muscle during a 15 min hydrocollator heat pack treatment. Twenty-two subjects had two 23 gauge needle microprobes inserted into the medial aspect of the anesthetized triceps surae muscle at 1 and 3 cm below the subcutaneous/muscle interface. In addition, a surface probe was used to record skin surface temperature. Data were collected on each subject for one of two randomly assigned treatments: (a) 15 min hot pack treatment; or (b) 15 min sham hot pack treatment (control). Temperature readings were recorded at 30 sec intervals. The change in peak temperature superficially, 1 cm and 3 cm, was analyzed using a 2-way analysis of variance (ANOVA) with repeated measures (p<.05). Both superficially and at 1 cm, we found a significant difference between the hot pack treatment and the sham hot pack treatment. At 3 cm no significant difference was found between the two treatments. Based upon our findings we consider hot packs to be a viable form of therapeutic heat both superficially and shallow intramuscular depth.


Considerable research interest has been directed toward better understanding the mechanisms by which runners are injured. Previous research has been unable to identify a relationship between specific anatomic abnormalities and abnormal biomechanics of the lower extremity with specific injuries. This lack of correlation could be the result of (a) poorly designed experiments, (b) incorporation of insufficient functional components into study designs and/or (c) the absence of an appropriate theoretical model. The purpose of the study was to investigate the relationships between (a) frontal plane kinematics (rearfoot motion), (b) sagittal plane kinematics and (c) kinetics (ground reaction impact forces) during distance running to gain a better understanding of lower extremity function and underlying mechanisms which might be implicated as possible precursors to injury. To accomplish this purpose, ten subjects ran under two different perturbed conditions (speed changes and obstacle heights) to facilitate increases in ground reaction impact forces (GRIF). Right side GRIF data were collected using an AMTI force platform (1000Hz), while both rear and sagittal view kinematic data were collected using an automated tracking system (200Hz). Subsequently, the knee angle during stance and parameters describing rearfoot motion were examined in conjunction with the impact forces. Finally, the biomechanical results were compared with the results from an orthopedic examination of the subjects to examine possible relationships between the two components. All data were evaluated using a single subject analysis with baseline adjustments before, between and after all perturbations. The results showed that increases in impact forces facilitated temporal disruptions between pronation/supination of the ankle and flexion/extension of the knee. Furthermore, the notion of differential response patterns between subjects was supported. Significant correlations between the subjects’ rankings on the orthopedic examination and biomechanical evaluation predicting susceptibility of injury suggested that incorporating various meaningful functional components into a properly designed study may allow for an enhanced understanding of mechanisms associated with running injuries.

Turner, John D. Identification of the health care professional at risk of low back injury using the IsoStation B-200 BSafe protocol, 1993. M.S., Brigham Young University (Earlene Durrant). (87pp 1f $4.00) PE 3574

The investigation was conducted to evaluate the predictability of low back injuries in female TIRR Hospital workers. Prior to assignment to new jobs, 156 employees were tested on the IsoStation B-200, using the BSafe software program, and then monitored for 6 months. During this time, all incidents of low back injuries were documented. One hundred and eleven subjects remained in the study. The occurrence of low back injuries and the time taken off work due to the injury were analyzed to determine if there was a correlation with potential predictors of back injury including isometric torque, dynamic power, BSafe composite score, and the individual scores in right and left rotation, flexion, extension, and right and left lateral flexion. The results indicated that there was no significant correlation between the BSafe score or any individual potential predictor score and the occurrence of low back injury. There was also no significant indication that time off work due to a sustained low back injury can be predicted with the BSafe test.

Wilcox, Kimberly L. BMI: improving its ability to predict body fat, 1994. M.S., Brigham Young University (A. Garth Fisher). (73pp 1f $4.00) PE 3579
The purpose of this study was to see if additional information would improve the ability of BMI (Body Mass Index) to predict body fat. A simple telephone questionnaire was used to gather anthropometric, dietary, exercise and personal history information. One hundred male volunteers between the ages of 18 and 28 were surveyed on the telephone, then measured in the laboratory to validate their percent body fat by hydrostatic weighing, to analyze their percent dietary fat and fill out a brief exercise questionnaire. Data from the telephone questionnaire was able to approximate aerobic-type exercise frequency and duration; however, responses to questions on diet did not correspond to the amount of fat a person consumed. The correlation between BMI and percent body fat yielded an r²=0.34. Including additional independent variables in the prediction equation did not add to the ability of BMI to predict body fat (R²=0.33). Results indicate that with this population the prediction power of BMI is not increased with additional variables.


Hydrostatic weighing with full expiration has been the accepted standard in the field of body composition measurement. Due to the cost and time necessary to hydrostatically weigh subjects, other less expensive means have been developed. The Natant Discs are a product of this development. Twenty-four female subjects were tested daily for 4 consecutive days to test the validity and reliability of the Natant Discs compared to the hydrostatic tank during full inspiration and full expiration. The Natant Discs were valid and reliable only during full expiration measurements (r=.992). There were also larger than normal discrepancies during full inspiration. Some of this can be attributed to the accuracy of the computer. Other findings were linked to the difficulty of inhaling maximally time after time.


P H Y S I O L O G Y A N D E X C E R C I S E E P I D E M I O L O G Y

Austen, Scott E. A VO₂ max test protocol for simulated cross-country skiing, 1994. M.S., University of Wisconsin-La Crosse (John P. Porcari). (32pp 1f $4.00) PH 1415

The purpose of this study was to develop a simulated cross-country skiing (XC) VO₂ max test protocol for use with the Nordicare Strider (NS). The three variables that control workload on the NS (resistance, speed, and elevation) were assessed during a pilot study. A protocol for the NS was developed from the findings of the pilot study and was compared to a modified Balke treadmill (TM) VO₂ max test (self-selected running speed with an increase in grade of 2.5% every 2 min). Volunteer male cross-country skiers (N=14) served as subjects and completed the tests in random order. When the physiological responses from the XC and TM tests were compared there was no significant (p>0.05) difference in VO₂ L·min⁻¹ (4.17 versus 4.29), VO₂ ml·kg⁻¹·min⁻¹ (56.2 versus 57.7), RER (1.15 versus 1.13), HR (183 versus 184), and RPE (17.8 versus 17.9), respectively. It was concluded that the XC test was a valid VO₂ max test for cross-country skiers.

Biberston, Dana M. The relationship between prostate-specific antigen, total cholesterol and triglyceride serum levels among active and sedentary senior males, 1994. M.S., Brigham Young University (Steven W. Heiner). (57pp 1f $4.00) PH 1416

This study determined relationships among prostate-specific antigen (PSA), total cholesterol, and triglyceride serum levels among active and sedentary senior males. Volunteers were obtained from local St. George community members and participants in the World Senior Games held in St. George, Utah in 1993. There were 1189 senior males, consisting of 677 active, 291 sedentary and 221 no activity recorded, who volunteered to receive a free blood test that measured their PSA, total cholesterol and triglyceride serum values. Senior males were classified as active or sedentary based on their response to the question, “Do you participate in aerobic activity 3 or more times a week?” A “yes” response determined they were active whereas a “no” response determined they were sedentary. Analysis of the data showed triglyceride levels were highly significant (p=0.0001) between active and sedentary groups. There was some significance between PSA and total cholesterol at the α=0.10 level. However, at α=0.05 level, there is no significance between PSA values and total cholesterol, serum triglycerides, and aerobic activity.


The purpose of this study was to examine the cardiorespiratory responses, metabolic costs, and ratings of perceived exertion of subjects exercising on a closed-chain stairclimbing ergometer while using a high frequency, low depth (HFLD) stepping protocol versus a low frequency, high depth (LFHD) stepping protocol. Subjects exercised the same total distance at equal velocities, times, and predicted metabolic equivalent (MET) levels during both stepping protocols. Eleven females and nine males ages 19 to 39 years (M±SD, 26.7±5±1) were evaluated using both stepping protocols. The order of testing protocol was randomized with 10 subjects performing the HFLD stepping protocol first and 10 subjects performing the LFHD stepping protocol first. Exercise was performed on a
closed-chain Climbox 200 stairclimbing ergometer. Each exercise bout was performed at a velocity of 15.24 m min\(^{-1}\) at an estimated MET level of 9.7, for 15 minutes. A metronome was used to regulate stepping frequencies and depths. Values for exercise heart rate (HR), oxygen consumption (VO\(_{2}\)), ventilation (VE), respiratory exchange ratio (RER), and ratings of perceived exertion (RPE) were recorded throughout the exercise bout. Steady-state values of all dependent variables from minutes 6 through 15 of each exercise bout were compared utilizing paired t-test analyses. The LFHD stepping protocol produced a significantly greater VO\(_{2}\), (33.21±2.65 versus 31.81±2.30 mL·kg\(^{-1}\)·min\(^{-1}\); \(p=0.04\)), HR (163.97±16.83 versus 160.50±17.33 beats·min\(^{-1}\); \(p=0.04\)), and RPE (3.77±1.12 versus 3.26±1.13; \(p=0.04\)) compared to the HFHD stepping protocol. These data revealed that performing the same amount of estimated work on a closed-chain stairclimbing ergometer is affected by the height of the stepping protocol. Protocols utilizing low frequencies and high depths of stepping are less metabolically efficient as indicated by higher VO\(_{2}\), HR, and RPE responses than protocols employing high frequencies and low depths of stepping.

Breit, Jeffrey T. The effects of three varying seat positions and three cadences on six physiological measurements associated with cycling, 1995. M.S., University of Wisconsin-La Crosse (William A. Floyd). (68pp If $4.00) PH 1418

Twelve male, categorized United States Cycling Federation (USCF) cyclists (23.1 yrs, 70 in, 163 lbs, 60.37 VO\(_{2}\) mL·kg\(^{-1}\)·min\(^{-1}\); 4.37 VO\(_{2}\) L·min\(^{-1}\)) performed 3 submaximal tests while riding a standard, USCF legal road bicycle mounted on a Giant C-Force indoor trainer. Seat position was altered for each submaximal test (Forward=88 degrees, Middle=85 degrees, Back=82 degrees). The Ss cycled at a constant workload of 19 mph throughout all tests. This workload was attained using 3 varying cadences: Fast=130 rpm, Medium=90 rpm, Slow=50 rpm. HR, RER, RPE, \(V_{\text{E}}\)\(_{O_{2}}\) \& \(V_{\text{E}}\)\(_{CO_{2}}\), and VO\(_{2}\) mL·kg\(^{-1}\)·min\(^{-1}\) & VO\(_{2}\) L·min\(^{-1}\) were compared with seat position coupled with cadence and cadence independent of seat position. The data were collapsed for each stage of each test. For each S there were 9 submax values for each variable analyzed by a 2-way ANOVA with repeated measures. Significant values were further analyzed using a Tukey’s post hoc test. No significant differences in physiological variables were found between 3 seat positions at 3 different cadences \((p>.05)\). Significant differences were found between varying cadences \((p>.05)\) independent of seat position. These differences demonstrated significant increases in physiological variables at high cadences.


This study examined the cardiovascular (CV) responses to exercise while wearing a transdermal nicotine patch. Fifteen apparently healthy volunteers (6M, 9F: x age=36.3 yrs, x ht=168.5 cm, x wt=75.5 kg) who wanted to quit smoking served as subjects. Each subject completed 3 symptom limited GXTs utilizing the Bruce protocol. The tests were completed on the initial quit day (PRE), 2 weeks later (2WK) while wearing the 21 mg Nicoderm patch, and 6 weeks after quitting (6WK) while still wearing the 21 mg Nicoderm patch. HR, SBP, and DBP were recorded at rest, at the end of each 3 minute stage, and at maximal exertion. No significant differences \((p>.05)\) were found in the resting, submaximal, or maximal CV responses to exercise while wearing the Nicoderm patch. No adverse ECG changes were observed. There were significant increases \((p<.05)\) in maximal ventilation, maximal tidal volume, and maximal oxygen consumption over the 6 week period. Thus it appears that exercising while wearing the 21 mg Nicoderm patch does not alter the CV responses to exercise in apparently healthy adults, and smoking cessation results in favorable changes in ventilatory function and aerobic capacity, independent of training.

Compardo, Jill L. The energy cost of stepping on the NordicSport Stepper in females, 1995. M.S., University of Wisconsin-La Crosse (Nancy K. Butts). (32pp If $4.00) PH 1420

This study evaluated exercise on the NordicSport Stepper (NSS), a hydraulic stepping system. Twenty-eighty females (age=18–41 yrs) volunteered as subjects. Each subject completed 3, 5-minute workloads at resistance level 3 on the NSS. They stepped in time with a metronome set at predetermined rates of 48, 56, and 66 steps per minute (spm), respectively. During all exercise sessions HR and RPE were recorded and expired air was analyzed using an automated open-circuit gas system each minute. There were no significant \((p>.05)\) differences among step rates for VO\(_{2}\) (l·min\(^{-1}\), ml·kg\(^{-1}\)·min\(^{-1}\)), \(V_{\text{E}}\)\(_{O_{2}}\), \(V_{\text{E}}\)\(_{CO_{2}}\), RER, or kcal·min\(^{-1}\). Heart rate was significantly \((p<.05)\) lower at rate 48 compared to rates 56 and 64. Peak VO\(_{2}\) and HR at rate 64 were 25 ml·kg\(^{-1}\)·min\(^{-1}\) and 145 bpm. Step height was significantly \((p<.05)\) lower at rate 64. Total work (step height x spm) was significantly \((p<.05)\) different at each rate of stepping. At a constant workload of 3 on the NSS, variations in step rate did not affect VO\(_{2}\) and thus, energy expenditure. Total work, however, significantly \((p<.05)\) increased from the lowest stepping rate to the highest. A higher stepping rate, therefore, may indicate a more efficient stepping pattern since the total work increased without a significant increase in the oxygen demand of the exercise.

Criswell, David S. Mechanisms of contractile dysfunction in the senescent rat diaphragm, 1994. Ph.D., University of Florida (Scott K. Powers). (86pp If $4.00) PH 1421
The purpose of these experiments was to test the hypothesis that age-related alterations in muscle composition cause the known age-related diaphragmatic specific force deficit. Intrinsic properties of the myofibrillar proteins and excitation-contraction (E-C) coupling in the rat costal diaphragm were assessed via an isolated skinned single fiber preparation. Secondly, the hypothesis that the age-related increase in diaphragmatic shortening velocity (V\text{max}) is caused by alterations in the senescent diaphragm myosin heavy chain (MHC) phenotype was examined. Isometric twitch and tetanic contractile properties as well as isotonic force-velocity relationships were measured in vitro on costal diaphragm strips from adult (9 month old; n=12) and senescent (26 month old; n=13) specific pathogen-free-barrier protected Fischer 344 rats. Costal diaphragm myofibrillar protein concentration, calcium-activated myosin ATPase activity, MHC composition, relative water content, connective tissue (C.T.) concentration, skinned single fiber maximal specific force (specific F\text{max}), succinate dehydrogenate activity, and histochemical relative connective tissue cross-sectional area (CSA) were also measured. Diaphragmatic maximal tetanic force (P\text{0,T}) normalized to strip CSA was 16.4% lower in the senescent diaphragms (21.03±0.4 N cm\(^{-2}\)) compared to the adult (25.16±0.5 N cm\(^{-2}\)) (P<0.001). There was a trend for myofibrillar protein concentration to be lower (12.5%) in the senescent diaphragms compared to the adult (P=0.09), while diaphragm water content was significantly higher in senescent diaphragms compared to the adult (P<0.01). Histochemical analysis of C.T. CSA revealed a 19.3% increase in the relative contribution of C.T. to the total CSA in the senescent diaphragms (P<0.01). Normalizing diaphragmatic P\text{0,T} to dry mass, C.T.-free CSA eliminated the senescent specific force deficit (P<0.05). In agreement, normalizing P\text{0,T} to myofibrillar protein CSA resulted in no age group differences in specific force (P>0.05). Specific Fo of costal diaphragm fibers did not differ between age groups (P>0.05). Diaphragmatic V\text{max} was 17.5% higher in the senescent diaphragms compared to the adult (P<0.001). This change was accompanied by a three-fold increase in the relative proportion of type IIb MHC (P<0.001). Correlational analysis indicated that ~30% of the variance in V\text{max} could be predicted by changes in type IIb MHC composition (r=0.56; P<0.05). These data support the hypothesis that the decline in in vitro maximal specific force observed in the senescent costal diaphragm can be explained by age-related alterations in the composition of the diaphragm muscle and the resulting reduction in myofibrillar protein concentration.

Doronio, Damian R. The effect of arm exercise on the energy cost of StairMaster stepping in males, 1995. M.S., University of Wisconsin-La Crosse (Nancy K. Butts). (60pp If $4.00) PH 1422

This study compared the metabolic responses of StairMaster 4000PT (SM) stepping with the addition of upper body exercise (WA) using the UB Sports Fitness Trainer (UBSFT) to SM stepping with no arm use (WOA). Step depth WA and WOA were also biomechanically analyzed. Twenty-two active males (19-32 yrs) completed 2, 20-minute tests on the SM. The tests consisted of stepping at 4, 5-min workrates (3, 5, 7, and 9). Two alternating workrates required arm usage on the first testing day and the other two workrates on the second testing day. During all tests expired air was analyzed using open circuit spirometry, HR and RPE were recorded, and step depth was videotaped. The results indicated VO\text{2} (L·min\(^{-1}\), ml·kg\(^{-1}\)·min\(^{-1}\), METS), RER, and step depth WA were significantly (p<.05) greater than WOA across all workrates. However, there were no significant (p>.05) differences WA or WOA at a given workrate. HR and RPE were not significantly (p>.05) different WA or WOA across all workrates. With the exception of step depth between workrates 7 and 9, VO\text{2} (L·min\(^{-1}\), ml·kg\(^{-1}\)·min\(^{-1}\), METS), HR, RPE, V\text{p2} and RER were significantly (p<.05) greater with increasing workrates. V\text{p2} and RER were significantly (p<.05) greater for the WOA at workrate 9. It was concluded that use of the UBSFT elicits similar energy costs as unsupported stepping.

Garrett, Donald J. Stage loading versus progressive loading in cardiac rehabilitation functional evaluation: comparison of the Bruce and Roy ramp treadmill protocols on post-Phase II CAD patients, 1995. M.S., University of Oregon (Gary A. Klug). (69pp If $4.00) PH 1423

Studies suggest that the exercise protocol selected for cardiac rehabilitation functional evaluation plays a great role in the outcome of hemodynamic and gas exchange parameters. The majority of North American clinics utilize the Bruce treadmill protocol. However, recent investigations has led to the hypothesis that a progressive, ramped treadmill protocol may elicit a peak VO\text{2} that is arrived at without interference from extraneous factors. Eighteen subjects, 17 men and 1 woman, average age 59 ± 14 years, who had just completed a Phase II program were subjects for this study. All subjects underwent two treadmill tests first using the Bruce or Roy protocol, respectively. Protocol order was randomized. All tests were performed using a 12-lead EKG and breath-by-breath gas exchange analysis. Data endpoints were collected at peak and ventilatory threshold time indices. A one-way ANOVA was performed on all data points to compare for differences between the Bruce and Roy protocols. The level of significance for all tests was 0.05. The ANOVA's exhibited no significant differences between the two protocols for any of the measured variables with the exception of overall test time. The Bruce protocol took an average of two minutes longer to complete the test. It is therefore concluded that the Roy
protocol is a valid and reliable indicator of functional aerobic capacity and may be a useful tool for clinical exercise testing.


Twenty-one apparently healthy females between the ages of 19 and 29 participated in the study. Subjects in the experimental group (n=12) exercised 4 times per week for 7 weeks. Training heart rates progressed from 70-75% of HRmax during week 1 to 80-90% HRmax during week 7. Training heart rates during the aerobic portion of the class averaged 82% of HRmax. Subjects in the control group (n=9) did not participate in a regular exercise program. Each subject performed a maximal treadmill test to volitional exhaustion prior to and upon completion of the study. The variables analyzed included body weight (kg), absolute VO2max (L/min), relative VO2max (ml/kg/min), HRmax (bpm), VEmax (BPTS) (L/min), RPE, and RERmax. The experimental group had increases in absolute VO2max (7.7%), relative VO2max (7.0%), and VEmax (11.7%), which were significantly greater than the control group from pre- to posttesting. It appears that participation in an Aqua Step aerobic training program is an effective way of improving aerobic capacity in college-aged females.

Gaughan, John P. *Phenylephrine-induced electrophysiological changes in cultured neonatal rat ventricular myocytes*, 1995. Ph.D., Temple University (Albert M. Paolone). (166pp 2f $8.00) PH 1425

Cell cultures of neonatal rat ventricular myocytes were maintained in culture for 96 hours. Twenty-four hour cultured myocytes were exposed to 20 uM phenylephrine, an alpha-adrenergic agonist, for 5 to 60 minutes and 48 to 72 hours and “long-lasting” (L-type) and “transient” (T-type) calcium currents were measured. Phenylephrine caused an increase in L-type calcium current density when applied acutely. This effect was completely blocked by propranolol but not by prazosin, suggesting that the increase was a beta-adrenergic effect. T-type calcium current density was similar in hypertrophied and control myocytes which suggested that T-type calcium channel expression was up-regulated to keep pace with the increased growth. In cultured hypertrophied neonatal rat ventricular myocytes, transient outward potassium current density was found to be significantly decreased suggesting its contribution to the observed prolongation of the action potential.


Exercise is one of the most potent stimuli to human growth hormone (hGH) secretion. It has been suggested that the blood acid-base disturbance associated with lactic acidemia plays a role in elevating blood hGH concentration during exercise, but only one study has previously investigated this hypothesis. The authors concluded that the blood hGH response was not linked to blood hydrogen ion concentration ([H+]') during long duration, submaximal exercise. It was therefore the purpose of the investigation to study the effect of venous blood [H+] on serum hGH concentration after an acute, high-intensity, anaerobic exercise bout. Ten normally-active men (age, mean plus/minus SD: 24.6 plus/minus 4.9 yrs) participated in a randomized, double blinded, counterbalanced experiment with crossover design. Each subject reported in a fasted state at the same time of day for two experimental sessions separated by one week. During each session, subjects were administered a decaffeinated tea solution containing either the supplement (S) (0.3g NaHCO3·kg bw-1) or placebo (P) (0.04g NaCl·kg bw-1) over a 45-min ingestion period. Venous blood samples were obtained before (baseline, (BL)) and 75 min after (PRE-EX) the ingestion period, as well as at 0, 5, 10, 15, 20, and 30 min post-exercise. The exercise task immediately followed the PRE-EX blood draw, and consisted of 90 sec of high-intensity cycle ergometry against an opposing force of 0.49 N (0.05kg) per kg of body weight. Statistical analyses were accomplished via repeated measures ANOVAs with Tukey’s post-hoc comparisons. There were no differences between the S and P conditions in mean or peak power output or total work during the exercise task. In the S condition, blood pH was significantly (p<0.05kg) higher than in the P condition at all timepoints except BL. The lowest mean (plus/minus SE) blood pH values were 7.14 (0.02) and 7.07 (0.02) for the S and P conditions, respectively, and occurred at 5 min post-exercise in both conditions. In the S condition, serum hGH concentration was not significantly elevated above BL until 20 and 30 min post-exercise, whereas the P condition demonstrated significant elevations above BL at 10, 15, 20, and 30 min post-exercise. Moreover, serum hGH concentration was significantly higher in P than in S at 15, 20, and 30 min post-exercise. These data indicate that an increased blood
Chronic fatigue syndrome (CFS) is characterized by debilitating fatigue and myalgia exacerbated by exercise, suggesting involvement of skeletal muscle. In vivo 31P-NMR spectroscopy (MRS) was used to examine the local metabolic response to dynamic wrist exercise and recovery in 11 CFS and 10 Control subjects. MRS allows determination of intracellular pH and level of inorganic phosphate (Pi), creatine phosphate (PCr), adenosine triphosphate (ATP), and the derived variable Pi:PCr. Exercise consisted of wrist flexion every 3 seconds with a 1:1 work to rest ratio. A microprocessor embedded ergometer controlled the ramp protocol for increasing resistance each minute and coordinated muscle contractions with MRS data collection. Resistance started at 20% of the single repetition maximum strength (IRM) and increased by 5% of IRM each minute, terminating at 5 minutes, or earlier if exhausted. Recovery was followed for at least 5 minutes. The pH and levels of phosphate metabolites were equivalent for both groups at rest and at pre-exercise, although the CFS group showed slight changes (p<0.05) in phosphate metabolites from rest to pre-exercise. There was no change in pH for either group from rest to pre-exercise (α=0.05). Both groups showed a normal response to exercise with a rapid fall in PCr and concomitant rise in Pi. There was a delayed fall in pH which continued through 2 minutes of recovery. Recovery of phosphate metabolites occurred in an exponential fashion, returning to pre-exercise levels within 5 minutes. The delayed recovery of pH was more linear and gradual, not returning to pre-exercise levels within 5 minutes. ATP levels remained stable during the exercise and recovery periods (α=0.05). There was no difference (α=0.05) between the CFS and Control groups for any of the measured metabolic variables at each minute of exercise and recovery. Previous 31P-MRS studies have found an accelerated intracellular acidosis during exercise, but without allowance for relative strength, and can thus be attributed to deconditioning. In the absence of any abnormal metabolic response in this study it was concluded that the CFS subjects had lower work capacity but did not exhibit a metabolic myopathy.

Parker, John F. Intratester and intertester reliability of the STP electronic inclinometer, 1994. M.S., University of Wisconsin-LaCrosse (Lisa A. Chase). (46pp 1f $4.00) PH 1428

This study determined the intratester and intertester reliability of the STP Electronic Inclinometer for measuring lumbar flexion. Twenty-eight college age female volunteers were tested on two occasions by two testers. Pearson product-moment correlation for the intertester reliability were .72 for day one and .65 for day two. Analysis of variance was used to derive intraclass correlation coefficients (ICC) for intratester reliability of true lumbar flexion measurements. Intraclass correlation coefficients were .92 for tester one and .88 for tester two. There were no significant differences (p<.05) between the means within each tester. ANOVA was used to derive ICC for intratester reliabilities for separate lumbar measurements used to determine true lumbar flexion. The ICC of gross lumbar flexion measured at thoracic number 12 and pelvis-hip flexion measured at the sacrum for tester one were .99 for both sites. For tester two the ICC for gross lumbar flexion and pelvis-hip flexion were .98 for both sites. There were no significant differences (p<0.05) between the means for each measure within each tester. The results suggest that the STP Electronic Inclinometer has acceptable intratester and intertester reliability. More research is needed on clinical patients with spinal dysfunction.


The purpose of this study was to determine the extent to which aerobic fitness was associated with serum cholesterol levels in 262 nine-and ten-year old children. The effects of gender, body composition, abdominal fat, and dietary saturated fat intake on the fitness-cholesterol relationship were also examined. A one-mile run/walk test was used to estimate level of aerobic fitness and to calculate a predicted minimum VO2, and serum cholesterol was measured in a certified lab. Lifestyle, demographic, and dietary intake information was gathered using written questionnaires and body fat was assessed using skinfold measurements. Children who were more fit had significantly lower levels of total cholesterol, LDL cholesterol, and triglycerides, and significantly higher levels of HDL cholesterol than their counterparts, even after controlling for gender and saturated fat intake. However, after adjusting for differences in body fat percentage and/or abdominal fat there was no significant relationship. Cause-and-effect conclusions are not warranted; however, poorly fit children appear to be at increased risk of elevated levels of serum cholesterol due primarily to increased levels of body fat.
Both prolonged exercise and electrical stimulation have been shown to depress the Ca\(^{2+}\)-ATPase activity in sarcoplasmic reticulum (SR), suggesting a connection between fatigue and Ca\(^{2+}\) regulation. To date, the link between exercise and SR dysfunction remains equivocal; however, it is known that whole-body exercise can increase muscle temperature to above 40°C in human and 42°C in rat. This dissertation research examined the independent and additive effects of muscle stimulation and increased muscle temperature on the activity of the CaCa\(^{2+}\)-ATPase.

Halothane-anesthetized Sprague-Dawley rats were secured in a stereotaxic lucite bath in which thermostated Ringer’s solution independently regulated the hindlimb intramuscular temperatures (37°C control and 42°C experimental). In this manner, the surgically-isolated gastrocnemius of each leg could be manipulated with regard to temperature and electrical stimulation. Ca\(^{2+}\)-ATPase assays were conducted on SR vesicles isolated by differential centrifugation. Electron microscopy illustrated that SR vesicles were formed and visually intact after the isolation procedure. Histochemistry indicated the stimulation protocol depleted white and red portions of the gastrocnemius muscle to 50-90% of control glycogen levels while independently regulated the hindlimb intramuscular temperatures (37°C control and 42°C experimental).

When temperature was held at 37°C, 90 min of electrical stimulation at 20 Hz (330 msec duty cycle and 670 msec rest) depressed SR Ca\(^{2+}\)-ATPase activity by 21% (p<0.05, n=5). Similarly, stimulation at 42°C reduced activity by 20% (p<0.05, n=5). When temperature was held at 23°C, no depression of Ca\(^{2+}\)-ATPase activity was observed after stimulation. However, elevated muscle temperature alone (without stimulation) depressed SR Ca\(^{2+}\)-ATPase activity by 28% (p<0.05, n=5).

Polyacrylamide gel electrophoresis demonstrated that isolated SR preparations from each of the experimental conditions had similar protein profiles, indicating the observed depressions of Ca\(^{2+}\)-ATPase activity were not due to differential contamination. These data suggest that muscle temperature may be a critical variable in the regulation of SR Ca\(^{2+}\)-ATPase activity. Thus, it is possible that the elevation in temperature which accompanies exercise may play a significant role in linking fatigue and SR function.

Higbie, Elizabeth J. Effects of concentric and eccentric isokinetic heavy-resistance training on quadriceps muscle strength, cross-sectional area and neural activation in women, 1994. Ph.D., University of Georgia (Kirk J. Cureton). (110pp 2f $8.00) PH 1432

The effects of concentric and eccentric isokinetic heavy-resistance training on muscular strength are not clearly established. Differences, if they exist, should be due to differential changes in muscle cross-sectional area or neural activation. The objective of this study was to compare the effects of concentric and eccentric isokinetic training on quadriceps muscle strength, cross-sectional area and neural activation. Untrained women, 18 to 35 years of age, were randomly divided into three groups: (a) concentric-training (n=16), (b) eccentric-training (n=19), and (c) control n=19). Average torque (N·m), cross-sectional area (cm\(^2\)) and integrated electromyographic activity (mV·s) of the quadriceps muscles were measured before and after 10 weeks. Average torque and integrated electromyographic activity were measured during maximal concentric and eccentric isokinetic muscle actions using a Kin-Com\(^{®}\) dynamometer. Muscle cross-sectional area measures at 20, 30, 40, 50, 60, 70, and 80% of femur length were obtained from magnetic resonance imaging scans. Average torque measured during concentric and eccentric maximal voluntary knee extensions increased 18.4 and 12.8% for the concentric-training (CT) group, 6.8 and 36.2% for the eccentric-training (ET) group and 4.7 and -1.7% for
the control (CON) group. Increases by the CT and ET groups were greater than the CON group (p<.05). For the CT group, the increase was no different when measured during concentric than eccentric isokinetic testing. For the ET group, the increase was greater measured during eccentric than concentric testing. Corresponding increases in maximal IEMG measured during concentric and eccentric isokinetic testing following strength training were 21.7 and 20.0% for the strength is best developed through training with concentric muscle actions and eccentric isokinetic strength is best developed through training with eccentric muscle actions. There is a test mode-training mode specificity for strength changes resulting from eccentric but not concentric training. Muscle hypertrophy and neural adaptations contribute to strength increases consequent to both concentric and eccentric training. INDEX WORDS: Concentric Isokinetic Training, Eccentric Isokinetic Training, Muscle Cross-sectional Area, Integrated Electromyography, Test Mode-Training Mode Specificity, Quadriceps Muscles, Women

Kaltenhauser, Marc. Twenty-four-hour blood pressure and coronary risk in alcoholics undergoing detoxification, 1995. M.S., University of Oregon (V. Patteson Lombardi). (97pp 1f $4.00) PH 1433

Twenty-four-hour, ambulatory blood pressure (BP) and coronary risk were assessed in 7 alcoholics undergoing detoxification. Values were compared with 7 nonalcoholics selected to match each alcoholic’s gender, age, height, weight, and percent of body fat. From the time of hospital admission to approximately 74 hours later, the alcoholics’ routine BPs had dropped significantly (p<0.05) from admission to approximately 74 hours later, the alcoholics’ weight, and percent of body fat. From the time of hospital selected to match each alcoholic’s gender, age, height, coronary risk were assessed in 7 alcoholics undergoing 1f $4.00) PH 1433

INDEX WORDS: Concentric Isokinetic Training, Eccentric Isokinetic Training, Muscle Cross-sectional Area, Integrated Electromyography, Test Mode-Training Mode Specificity, Quadriceps Muscles, Women

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Twenty-four-hour, ambulatory blood pressure (BP) and coronary risk were assessed in 7 alcoholics undergoing detoxification. Values were compared with 7 nonalcoholics selected to match each alcoholic’s gender, age, height, weight, and percent of body fat. From the time of hospital admission to approximately 74 hours later, the alcoholics’ routine BPs had dropped significantly (p<0.05) from 142.9±10.5 mm Hg (mean±SEM) to 124.3±5.3 mm Hg, two full stages according to JNC V guidelines (from Stage 1 hypertension to normotension). Compared to controls, alcoholics had significantly (p<0.001) lower nighttime (22:00-5:59), and significantly higher (p<0.05) daytime (6:00-21:59) pressures. Coronary risk profiles were similar. These statistically and clinically significant results demonstrate that time of BP assessment is crucial particularly for alcoholics. Daytime measures may lead to the inappropriate classification of hypertension, while nighttime measures may falsely indicate normotension. Future studies should be directed to examining the long-term effects of withdrawal from alcohol on BP and coronary risk.

Klootwyk, Cynthia J. Physiological cost of selected preprogrammed exercise workouts on th Stairmaster 4000PT, 1993. M.S.Ed., Northern Illinois University (Sharon Ann Plowman). (64pp 1f $4.00) PH 1434

The purposes of this study were to (a) describe and compare physiologic responses to selected preprogrammed workouts (Blast Off (B), Pike’s Peak (P), and Steady Climb (S)) at level five on the StairMaster 4000PT, and (b) to compare the actual to the estimated caloric expenditure.

Twenty-nine experienced stair-climbers (M=5, F=24; X age=26.2±5.9 yr; X VO2 max=51.4±3.9 ml·kg⁻¹·min⁻¹) served as subjects. A one way repeated measures ANOVA revealed no significant physiologic tHR (bpm): X B=144.31±15.21, X P=143.76±12.90, X S=141.10±12.84; SBP (mmHg): X B=150.83±20.34, X P=155.14±19.08, X S=154.07±17.12; DBP (mmHg): X B=70.62±11.30, X P=72.41±13.08, X S=72.79±9.32; rate pressure product: g B=214.83±39.42, X P=223.41±36.32, X S=216.83±29.47), metabolic (VO2 (ml·kg⁻¹·min⁻¹)): X B=29.38±1.27, X P=27.85±2.67, X S=29.25±1.52; respiratory exchange ratio: X B=0.88±0.04, X P=0.88±0.05, X S=0.89±0.04; blood lactate (mM): X B=1.92±1.11, X P=2.03±0.99, X S=2.92±1.25), or psychologic tRPE: X B=12.79±1.35, X P=13.17±1.54, X S=13.72±1.33) differences between the three programs (p>0.01). A dependent t-test revealed the difference between the caloric expenditure as estimated (X B=128.86±24.63, X P=128.48±26.08, X S=130.79±25.23) by the Stairmaster 4000PT console and as measured (X B=144.03±30.16, X P=134.86±24.48, X S=143.35±29.20) for each program to be statistically significant (p<0.05) though not practically significant (±1 kcal·min⁻¹/15 min). The results of this study indicate that physiologic, metabolic, and psychologic responses were consistent between various programs at an intensity level of five and that the caloric expenditure as calculated by the Stairmaster 4000PT console provides a practical estimation of caloric expenditure.

Lapachet, Richard A.B. Body fat and exercise endurance in trained rats adapted to a high fat and/or high carbohydrate diet, 1994. M.S., Indiana University (Wayne C. Miller). (118pp 2f $8.00) PH 1435

To study how diet composition affects exercise endurance and body composition, 48 male Sprague-Dawley rats were treadmill trained for 8 weeks while consuming either a high fat (F) or high carbohydrate (C) diet. The diets were switched for half the rats in each group 3 days prior to sacrifice, during which time the rats did not exercise. Half the rats receiving each of the 4 diet combinations were taken at rest (R) or exhaustion (E), resulting in 8 groups; CCR, CFR, FFR, FCR, CCE, CFE, FFE, and FCE. ANOVA revealed that resting glycogen in the FCR group was enhanced in muscle (19%-33%) and liver (23%) when compared to controls. Each group’s exercise time to exhaustion revealed no significant physiologic tHR (bpm): X B=144.31±15.21, X P=143.76±12.90, X S=141.10±12.84; SBP (mmHg): X B=150.83±20.34, X P=155.14±19.08, X S=154.07±17.12; DBP (mmHg): X B=70.62±11.30, X P=72.41±13.08, X S=72.79±9.32; rate pressure product: g B=214.83±39.42, X P=223.41±36.32, X S=216.83±29.47), metabolic (VO2 (ml·kg⁻¹·min⁻¹)): X B=29.38±1.27, X P=27.85±2.67, X S=29.25±1.52; respiratory exchange ratio: X B=0.88±0.04, X P=0.88±0.05, X S=0.89±0.04; blood lactate (mM): X B=1.92±1.11, X P=2.03±0.99, X S=2.92±1.25), or psychologic tRPE: X B=12.79±1.35, X P=13.17±1.54, X S=13.72±1.33) differences between the three programs (p>0.01). A dependent t-test revealed the difference between the caloric expenditure as estimated (X B=128.86±24.63, X P=128.48±26.08, X S=130.79±25.23) by the Stairmaster 4000PT console and as measured (X B=144.03±30.16, X P=134.86±24.48, X S=143.35±29.20) for each program to be statistically significant (p<0.05) though not practically significant (±1 kcal·min⁻¹/15 min). The results of this study indicate that physiologic, metabolic, and psychologic responses were consistent between various programs at an intensity level of five and that the caloric expenditure as calculated by the Stairmaster 4000PT console provides a practical estimation of caloric expenditure.
trained rats who receive a carbohydrate load following adaptation to a HFD, and that dietary fat is a potent inducer of body fat deposition in spite of intense exercise training.

Lawrence, Lisa M. *A comparison of energy cost between the NordicSport aerobic cross-training self-propelled treadmill and a motorized treadmill*, 1994. M.S., University of Wisconsin-La Crosse (Nancy K. Butts). (41pp 1f $4.00) PH 1436

The physiological responses of walking on a motorized treadmill (MT) versus a nonmotorized treadmill (NMT) were compared in 25 male volunteers (mean age=26±5.7). Subjects completed 3, 5 minute steady-state exercises at 2.0, 2.5, and 3.0 mph and 9.6% grade for a total of 15 minutes. All physiological variables (VE, HR, VO₂, METs, and Kcals) were found to be significantly (p<0.05) higher at each submaximal workload on the NMT except for RER and RPE, which were only significant (p<0.05) at the last 2 workloads of 2.5 and 3.0 mph. Estimated METs calculated according to the ACSM (1991) prediction equations were compared to the actual METs. The actual and calculated METs were similar while walking on the MT at 2.0, 2.5, and 3.0 mph and 9.6% grade, but the actual values obtained on the NMT were significantly (p<0.05) higher (29%) than those estimated from the prediction equations at all speeds. It was concluded that walking on the NMT increases the energy cost an average of 33.9% above walking on a MT at the same speeds and grade.

Lindsey, Lewis R. *The effects of sleep deprivation on aerobic and anaerobic performance*, 1994. Ph.D., University of Southern Mississippi (Walter R. Thompson). (166pp 2f $8.00) PH 1437

Fifteen healthy males (x age=25 yrs; x relative maximal oxygen consumption = 54.7 ml·kg⁻¹·min⁻¹) volunteered to participate in this study to determine the effects of 30 hours sleep deprivation (SD) on aerobic and anaerobic performance. Subjects serving as their own controls were randomly assigned first to the SD condition, or non-sleep deprivation (NSD) condition. Subjects were tested at the same time of day for both conditions. The anaerobic portion of the exercise protocol required each subject to perform a 30s Wingate anaerobic power test on a cycle ergometer to measure mean power output (Watts) followed by 30 minutes rest. Subjects then performed a 30-minute submaximal treadmill run at a constant speed determined to represent 65% of their maximal oxygen consumption followed by a 10-minute recovery period. Aerobic measures across this 40-minute time period were analyzed for heart rate, cardiac output, expired ventilation, oxygen consumption, and systemic vascular resistance. Allowing for the obvious differences in the aerobic variables between the 30-minute run and 10-minute recovery, statistical analysis of the data indicated no significant effects (p>0.05) for any of the parameters with respect to SD or NSD conditions. It was concluded that 30 hours of sleep loss does not significantly impair physiological performance of the type and duration used in this study.


This study was designed to determine the time course of skeletal muscle protein degradation and synthesis rates following eccentric contraction-induced injury and also to evaluate the relative contributions of intrinsic proteases and phagocytic activity to protein degradation in injured muscle. Mouse anterior crural muscles were injured in vivo, then at various times following injury, EDL muscles were isolated and studied for indices of muscle injury, protein metabolism, and phagocytic cell infiltration. A group of animals was administered anti-polymorphonuclear cell and anti-macrophage antisera prior and subsequent to induction of muscle injury in an attempt to attenuate phagocytic infiltration into injured muscle (so that proteolysis due to intrinsic proteases could be measured). Antiserum-treated mice were rendered neutropenic; however, there was no difference in any of the variables measured between muscles from these animals and muscles from normal animals. Protein degradation rates and phagocytic cell infiltration in injured muscles began to increase about 24 hr after injury was induced, peaked about 48 hr, and remained elevated until at least 120 hr post-injury. Protein synthesis rates and muscle RNA content began to increase about 48 hr after injury was induced and continued to rise through 120 hr post-injury. Fourteen days post-injury protein degradation and synthesis rates were normal. These data indicate that protein degradation in injured skeletal muscle is not elevated until phagocytic cells invade the tissue. Because neutropenia had no effect on the rate of protein degradation or phagocyte infiltration, neutrophils do not appear to play a significant role in the injury process. The data also suggest that the intrinsic proteases do not cause increased protein degradation during the first few hours after injury is induced. Their contribution once the phagocytic cells invaded the tissue could not be determined. Index words: Muscle Injury, Eccentric Exercise, Protein Metabolism, Protein Degradation Rates, Protein Synthesis Rates, Macrophages, Polymorphonuclear Cells, Proteases.

Moser-Hoff, Kari K. *Acute metabolic responses to water aerobics and land aerobics*, 1993. M.S., South Dakota State University (Jack Ewing). (91pp 1f $4.00) PH 1439

The purpose of the study was to determine the acute metabolic responses to water aerobics. Kilocalories expended, volume of oxygen consumed, respiratory exchange ratio and minute ventilation were the dependent
variables measured. Forty female students, of moderate fitness levels, with previous aerobics experience (age 18 to 26 years), were recruited to be subjects. Twenty of the subjects had experience with land aerobics (group 1) and the other 20 subjects had experience with water aerobics (group 2). Following the reading and signing of an Informed Consent Form and a Health History Questionnaire, the subjects were required to perform two familiarization sessions. These sessions took place in the pool or in the dance studio depending on the group of the subject. During the testing sessions, expired metabolic gases were collected for one minute at the beginning of every fourth minute while subjects performed the 30 minute videotaped routine. Collected gases were analyzed for oxygen and carbon dioxide content in order to determine the volume of oxygen consumed. Using the respiratory exchange ratio and the volume of oxygen consumed, the number of kilocalories expended during the activity was determined. No attempts were made to statistically compare water aerobics to land aerobics.


The relationships between absolute muscular strength and relative muscular strength to 55 m sprint time was examined in 15 male and female college-level track athletes. Absolute muscular strength (kg) was assessed via one repetition maximum tests on the Universal Gym leg press; relative muscular strength was calculated by dividing absolute muscular strength by athletes’ body weight (kg). Athletes’ best competitive 55 m sprint time during the 1994 Indoor Track Season was used as the 55 m speed measure. Significant (p<.05) Pearson product moment correlation coefficient were produced between absolute muscular strength and 55 m sprint time (r=-.55) and absolute muscular strength and 55 m sprint time corrected for leg length (r=-.55). No significant relationships were observed between absolute muscular strength and 55 m sprint time (r=-.37) or 55 m sprint time corrected for leg length (r=-.195). The results of this study indicated that at sprint distances of 55 m, stronger sprinters of either gender had faster times irrespective of their body mass.

Santolin, Barbara E. The relative safety of morning and afternoon exercise in patients with coronary artery disease, 1994. M.S., University of Wisconsin-La Crosse (John P. Porcari). (59pp 1f $4.00) PH 1441

Sixteen males (mean age=62.1 yrs) with documented coronary artery disease performed a 30-minute bout of exercise in the morning (6:00-8:00 a.m.) and in the afternoon (4:00-6:00 p.m.). Each session was conducted on a motorized treadmill at an identical speed and grade. HR, SBP, and DBP were measured at rest, every 5 minutes during exercise, and in recovery. ECG was monitored continuously and recorded every 5 minutes. Blood samples were drawn before and after both the A.M. and P.M. exercise sessions and the plasma was analyzed for tissue-type plasminogen activator (tPA), plasminogen activator inhibitor-type 1 (PAI-1), and tPA/PAI-1 complex. There were no significant differences (p>.05) in resting HR, SBP, or DBP, or in exercise HR, SBP, DBP, RPP, or RPE responses between exercise sessions. There were also no differences in ST segment responses or dysrhythmias between A.M. and P.M. exercise. Data for tPA, PAI-1, and tPA/PAI-1 complex concentrations are presented below:

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<tr>
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<th>A.M.</th>
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<tr>
<td></td>
<td>Pre</td>
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<tr>
<td>tPA</td>
<td>16</td>
<td>1.4±0.50</td>
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<tr>
<td>PAI-1</td>
<td>14</td>
<td>16.6±9.12</td>
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<td>Compl. 10</td>
<td>1.5±1.39</td>
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Overall, mean preexercise tPA and tPA/PAI-1 complex values were significantly higher (p<.05) in the A.M. versus the P.M. and increased significantly (p<.05) from pre to post exercise for both sessions. Mean PAI-1 values were significantly higher (p<.05) in the A.M. and did not change significantly (p>.05) as a result of exercise. In conclusion, there were no significant differences in the hemodynamic or ECG responses between A.M. and P.M. exercise, and since both tPA and tPA/PAI-1 complex increased with exercise, favoring fibrinolysis, it would appear that it is safe for patients with coronary artery disease to exercise at any time of the day.


The influence cryotherapy, thermotherapy, Neoprene ankle sleeve, and a control had on total body balance and proprioception was investigated with the use of a Bongo Board. Fifteen males and 15 females with no history of lower extremity pathology within 1 year and no vasospastic disorders or hypersensitivity to cold or heat participated in the study. Bongo Board proficiency was established prior to the testing sessions in order to minimize the learning effect. Subjects were deemed proficient when they were able to remain in balance between 40 and 50 seconds in a 1-minute trial. Treatment conditions were randomly ordered on four separate testing days and included: cryotherapy; thermotherapy; Neoprene ankle sleeves; or a control, with no cryotherapy, thermotherapy, or Neoprene ankle sleeves. Testing consisted of a 1-minute warm-up, 1-minute pretest, 20-minute treatment period, and five posttests. One of the previously mentioned treatment conditions was administered during the 20-minute treatment period. Five, 1-minute
The lack of differences during leg exercise between the NCS and the NTA can be attributed to the indicator settings for both devices accurately indicating measured resistances. The measured differences in forward leg resistance between the NCS and the NTA was apparently insignificant.

Tarara, Daniel. *A comparison of peak VO₂ and HR responses during arm crank ergometry versus upper-body pedaling*, 1995. M.S., Purdue University (Darlene A. Sedlock). (94pp 1f $4.00) PH 1444

This investigation compared the peak and submaximal VO₂ and HR responses of arm crank ergometry (ACE) to those of upper-body pedaling performed on a modified electronic stair stepper (mESS) and a manufacturer intact electronic stair stepper (ESS). Sixteen males (age=22.8±2.7 years, wt=82.0±12.2 kg, ht=182.0±6.4 cm) volunteered to participate in this investigation. Each subject performed a maximal effort graded exercise test on each ergometer. Peak power output (PO) and rating of perceived exertion (RPE) were significantly (p<0.01) greater during ACE compared to mESS; however, no significant difference (p>0.05) in peak HR (177.9±10.8, 178.5±11.8, b-min⁻¹), absolute VO₂ (2.28±0.45, 2.12±0.14, l·min⁻¹), relative VO₂ (28.3±6.1, 26.3±5.4, ml·kg⁻¹·min⁻¹) VCO₂ (2.55±0.59, 2.27±0.48, l·min⁻¹) RER (1.24±0.12, 1.19±0.11), and VE_BTPS (94.5±30.4, 86.9±22.9, l·min⁻¹) were found between ACE and mESS, respectively. In contrast, peak HR (158.8±21.2), absolute VO₂ (1.69±0.29), relative VO₂ (21.2±4.5), VCO₂ (1.76±0.36), and RER (1.09±1.68) for ESS were significantly (p<0.05) lower compared to ACE and mESS. On the basis of PO, mESS elicited significantly greater peak and submaximal (p<0.05) HR, absolute VO₂, relative VO₂, VCO₂, VE_BTPS, and RPE compared to ACE. Linear regression analysis of submaximal VO₂/HR relationships showed a significant difference (p<0.01) among all modes. Results indicate that mESS and ACE can produce similar cardiopulmonary and physiological stress, while ESS elicited lower responses during maximal effort testing. However, peak and submaximal mESS elicits greater cardiopulmonary and metabolic stress when compared to ACE on the basis of PO. The failure of VO₂/HR relationship to be similar among all modes limits a generalized prediction of upper-body metabolic stress on the basis of HR values, and therefore requires ergometer specific testing.


A meta-analysis was conducted involving within-group, double-blind studies to determine the effect of sodium bicarbonate (NaHCO₃) ingestion on athletic performance. The purpose of the study was to replicate an analysis published in 1993 by L. G. Matson and Z. V. Tran, who
used a controversial approach in calculating and analyzing effect sizes. Fifty-three studies were collected, of which 30 met the criteria for inclusion. Thirty-six effect sizes were calculated either using information provided in the study or assuming a correlation between the experimental and placebo trials of .60 and .96. These values were used to compute effect sizes when insufficient information was reported by researchers. This resulted in the estimation of a lower (r=.60) and upper (r=.96) bounds of effect size. Weighted effect sizes for both the lower and upper bound were determined for all studies and levels of variables which might explain the variability in effect sizes. Large effect sizes calculated for r=.96 were found to be distorted by their variance in determining the weighted, overall effect size and were not considered to be credible. The overall treatment effect for the lower limit was 0.25. This translates into a .33-second improvement in 400-m time under alkalosis. Effect sizes were found to be homogeneous overall (QT, p>.05), and no differences were found among average effect sizes for levels of specific variables (e.g., dose, test duration, etc.) (Qb, p>0.00625). There appears to be an ergogenic effect of 0.25 standard deviations; however, more studies employing a better methodology need to be conducted before the magnitude of the ergogenic effect can be described adequately.


The maximum ability of the respiratory muscles to generate ventilatory work may limit maximum exercise capacity. To determine whether ceiling of the respiratory workrate (Wrs max) limits peak exercise performance, 8 moderately trained male cyclists (age=23.1 plus/minus 1.6 (SE) years, weight=77.2±2.9 kg, and VO2 max=59.0±1.1 ml kg-1·min-1) underwent 4 single blind, randomly assigned, and 15 w·min-1 incremental cycling tests until exhaustion: (1) breathing humidified room air (N2-O2) to serve as normal respiratory impedance (including resistance offered by the breathing apparatus), (2) breathing humidified normoxic helium (He-O2) to decrease normal respiratory flow resistance, (3) breathing N2-O2 with moderate restricted external airway (-12.7 and 11.7 cm H2O mouth pressure at 2 L·s-1 for constant inspiratory and expiratory flow, respectively) (R-N2-O2) to accelerate the onset of Wrs max, and (4) breathing He-O2 to unload the imposed resistance (R-He-O2) to delay the onset of Wrs max. Selected respiratory and cardiovascular changes were measured breath-by-breath via pneumotachographs, gas analyzers, esophageal and gastric balloons, occlusion valve, and computerized data acquisition technique. The average data from the last 30-s of each minute and at peak cycling workrate (the last cycling workrate that a subject was able to maintain for at least 30 seconds) were used. Rating of perceived breathing effort (RPBE) at the end of each minute and at exhaustion, and complaint at exhaustion were also obtained. One-tail paired t-tests with adjustments for the level of significance by Bonferroni’s method were used to compare the data between He-O2 and N2-O2, R-N2-O2 and N2-O2, and between R-He-O2 and R-N2-O2. Time to exhaustion and peak cycling workrate increased 2% (p>0.0167) in He-O2, decreased (p<0.0167) 15% and 6% in R-N2-O2 and R-He-O2, respectively, compared to N2-O2. At exhaustion in R-N2-O2, all subjects complained of breathing effort, and the most severe RPBE (88±5% of maximum) was obtained. Respiratory workrate (Wrs max) the sum of workrate overcoming external flow resistance and workrate done on the lungs, increased exponentially and reached similar (p>0.0167) plateaus (Wrs max) at exhaustion in N2-O2, R-N2-O2 and R-He-O2. The highest Wrs max being obtained in R-He-O2 (11.0±1.5 w) was used for the Wrs max. The present study demonstrates that the onset of Wrs max limits the peak VO2 when flow resistance is increased. Flow resistive loading accelerated the onset of Wrs max, leading to a more rapid exhaustion. Unloading the imposed resistance by He-O2 delayed the onset of Wrs max and exhaustion. In N2-O2, although Wrs max reached 80% of maximum at exhaustion, it did not seem to limit peak VO2. He-O2 unloading of the normal respiratory flow resistance did not increase (p>0.0167) peak VO2; however, Wrs max decreased to 62% of maximum. It is suggested by the data that airway closure caused by the increase of the dynamic compression pressure during forced expiration may have set an expiratory flow limitation in N2-O2 at near peak cycling workrate, since He-O2 unloading increased pulmonary ventilation (2-10%, p<0.0167), as a result of an increase of mean expiratory flow (7-13%, p<0.0167) accompanied by a decrease of mean esophageal pressure (2-7 cm H2O, p<0.0167).

Hypoventilation occurring during R-N2-O2 was reversed in R-He-O2. The changes of ear arterial O2 saturation and end-tidal partial pressure of CO2 at near peak cycling workrate were related to the levels of VE. Diaphragm fatigue was not found in all conditions based on the critical mean transdiaphragmatic pressure (Pdi) and diaphragm tension time index (TTdi), which were defined during resistive loading with square wave Pdi swing generation. However, reducing respiratory flow resistance by breathing He-O2 in both cases decreased TTdi as well as Wrs max, indicating that less energy was expended by the respiratory muscles. Central inspiratory drive assessed by mouth occlusion pressure (Pm), increased in direct proportion with Wrs max independent of the changes of respiratory flow resistances. It is concluded that the ceiling effect of respiratory workrate limits peak exercise performance when respiratory workrate exceeds 80% of maximum during external flow resistive loading.

The problem of the study was to examine the effects of cystic fibrosis (CF) and cystic fibrosis related diabetes mellitus (CFRDM) on fuel utilization and energy expenditure in stable ambulatory patients during rest, exercise, and recovery from exercise. The purpose was to characterize the energy needs and pattern of fuel utilization for patients with or without CFRDM because in increased energy expenditure may lead to malnutrition followed by a decrease in survival. Twenty-seven subjects, 10 females and 17 males, were the participants from which two patient groups and a Control group were derived. The CF group consisted of 3 female and 7 male patients (21.6 to 41.8 years of age) without CFRDM. Subject characteristics of the CF group were 31.1 years of age, 63.8 kg of weight, and 172.3 cm in height. The CFRDM group consisted of 2 female and 5 male patients (25.9 to 38.3 years of age) diagnosed with CFRDM. Subject characteristics of the CFRDM group were 33.1 years of age, 62.9 kg of weight, and 168.9 cm in height. The Control group consisted of 5 female and 5 male subjects (25.9 to 38.3 years of age) without CF, diabetes mellitus, or any other known diseases. Subject characteristics of the Control group were 25.6 years of age, 61.8 kg of weight, and 172.3 cm in height. Fuel utilization and energy expenditure variables were studied across the groups and across the three time periods. The study also observed physical characteristics and lung function, body composition, and nutrient intake and content. There appears to be very little difference between patients with CF and patients with CF and CFRDM in terms of percent carbohydrate, fat, and protein utilization during rest, exercise, and recovery. Although not statistically significant, energy expenditure was increased for both CF groups compared with the Control group during the rest and exercise periods. During the recovery period, patients with CF and CFRDM use significantly more energy when expressed in kcal·kg·min⁻¹ and kcal·FFM⁻¹·min⁻¹ than patients with CF without CFRDM. Patients with CF, regardless of the presence of CFRDM, use significantly more energy during recovery when compared to the Control group. Patients with CF did not use any more energy during a 30-min low-to-medium intensity exercise bout on a treadmill than subjects in the Control group when compared from baseline values. Following exercise, energy expenditure values for patients with CF tend to remain higher than baseline after a 45-min recovery period when compared to Control subjects whose values at the end of recovery tend to be lower than baseline. Energy expenditure during recovery was higher in both CF groups than in the Control group and higher in the CFRDM group than in the CF group. The higher energy expenditure during recovery appears to be caused by an increased minute ventilation and tidal volume driven by an elevated circulating level of epinephrine.

This study investigated the physiological responses of cross-country skiing at 3 different speeds using the NordicSport CrossTraining System™ (NSCTS). Twenty-four healthy males (mean age=26.6±6.3 yrs) volunteered as subjects. Following practice sessions to become proficient on the NSCTS™, each subject performed 3 5-minute bouts of steady state exercise for a total of 15 minutes. The speeds of 2.0, 2.5, and 3.0 mph were used at a 9.6% grade with no resistance for arms and legs. During the exercise session, VO₂ (L·min⁻¹, ml·kg⁻¹·min⁻¹, METS), HR, VE, Kcal, RER, and RPE were measured each minute. It was found that as the speed increased, all physiological responses increased significantly (p<.05) at each stage, indicating an increase in energy cost. It was concluded that the NSCTS™ may provide a means for cardiovascular improvements and weight management.

Youngstedt, Shawn D. The influence of exercise on caffeine-induced insomnia, 1995. Ph.D., University of Georgia (Patrick O’Connor, Rodney K. Dishman). (204pp 3f $12.00) PH 1449

Insomnia is one of the most common medical complaints. For example 35 % of all adults report insomnia at some point during the previous year (Mellinger, Balter, & Uhlenhuth, 1985). Half of these individuals perceive their insomnia to be serious (Mellinger et al., 1985). Insomnia is associated with decreased work productivity, debilitated daytime cognitive functioning, increased mortality due to automobile accidents (National Commission on Sleep Disorders Research, 1993), and increased all cause mortality (Wingard & Berkman, 1983). The purpose of the present study was to examine whether submaximal cycling exercise can improve selected sleep parameters following daytime consumption of a high dose of caffeine. In addition, nocturnal temperature decreases and pre-sleep anxiety were examined as possible correlates of sleep improvement. To the best of our knowledge, this was the first study to examine the influence of exercise on sleep in young individuals whose sleep was experimentally disturbed. It was hypothesized that: (1) heavy daytime caffeine ingestion (1200 mg) would elicit significant disturbances in nocturnal sleep (i.e., increases in sleep onset latency (SOL), wakefulness, and duration of stage I sleep; decreases in sleep efficiency, TST, and SWS); (2) daytime exercise would significantly reduce caffeine induced nocturnal sleep disturbances compared to the quiet rest control condition; (3) significant decreases in nocturnal temperature would be observed following daytime exercise compared to the control condition; and (4) pre-sleep anxiety would be lower following daytime the exercise to non-exercise conditions.

Weiland, Kathryn A. Energy cost at three different speeds on a cross-country ski simulator, 1995. M.S., University of Wisconsin-La Crosse (Nancy K. Butts). (38pp 1f $4.00) PH 1448
The effects of Parkinson’s disease (PD), movement complexity, and practice on performance and learning of rapid, arm-reaching movements were studied. Persons with and without PD practiced two rapid arm-reaching tasks with movement complexity manipulated by the number of steps in a movement sequence and the number of directional changes in the movement. The tasks were practiced for 120 trials each across a 2 day period. The response programming stage of information processing was studied by analyzing the overall reaction time latency of each movement and its fractionated sub-components, premotor and motor time. Movement execution speed was analyzed by recording movement times for each task. A learning effect for practice was studied by comparing the responses for a pretest to those for immediate (10 min rest interval) and delayed retention tests (48 hour rest interval). The complexity by test session results of this study demonstrated that, initially and following practice, persons with and without PD demonstrated similar response programming as manipulated by movement complexity. Reaction and premotor times supported a movement complexity effect. With practice of the two arm-reaching tasks, both persons with and without PD exhibited a learning effect for response programming and movement times and a diminished movement complexity effect for each of the retention intervals. Transfer of practice for the rapid, arm-reaching skill to performance of a manual dexterity skill, the Box and Block Test, was also studied. Transfer of skill was analyzed by comparing the dexterity scores (the number of blocks transported in 60 sec) performed prior to and after practice of the arm-reaching tasks. Persons with PD demonstrated a deficit for timed manual dexterity. Following practice of the arm-reaching tasks, persons with and without PD improved their manual dexterity indicating a possible transfer or test-retest effect. This study demonstrated that participants with PD performed response programming of rapid, arm-reaching tasks of varied movement complexity as well as the control participants and that practice had a similar learning effect for persons with and without PD.

Black, Michael W. Effects of a corporate sponsored fitness program on health care costs: a comparison of users and nonusers, 1995. M.S., University of Wisconsin-La Crosse (Philip K. Wilson). (77pp 1f $4.00) HE 548

The sample of 3,974 employees of Apple Computer were divided into male (n=2,088) and female (n=1,886) groups and then further categorized according to age and the degree of participation in the Apple Health and Fitness Program. Mean age for males was 34.5 years ±7.55, while the mean age for females was 34.7 years ±7.58. The mean health care cost was $1,053.8±3,705 for males and $1,420.0±4,168.1 for females. Participation was measured over an 11 month testing period and divided into 4 subgroup headings: no use, low use, moderate use, and high use. Rather than use overall health care means, independent age group means were used to assign cost status. After skewness and kurtosis measurements determined that the sample was not normally distributed, chi-square tests were applied to locate statistical significance. In both males and females, chi-square tests examined differences in high and low cost status for the subjects within a particular age group. For both male and female subjects no significant differences were found within the age and participation subgroups (p>.05). The same subject and age groups were then categorized into just 2 usage groups: user and nonuser. No significant difference was found among male users and the nonusers within the three age groups (p>.05). Meanwhile, a significant difference was found in females 31 to 40 years old and females 41 and older (p<.05). In females 31 to 40 the nonusers were found to have significantly lower medical costs while the opposite was true for females over 41 years of age.

Gahimer, Julie E. Prevalence and effectiveness of patient education in physical therapy practice, 1994. H.S.D., Indiana University (Mohammad R. Torabi). (121pp 2f $8.00) HE 549

The purpose of this study was to investigate the amount, type, and quality of informal patient education in physical therapy practice. The relationship of the prevalence of informal patient education given by therapists was examined in light of the number of years in practice, highest degree earned, and professional preparation. In addition, therapist’s self evaluation, supervisor’s evaluation and the patient’s evaluation regarding inclusion of informal patient education and the therapist’s actual behavior was studied. Thirty-seven physical therapists from nine outpatient orthopaedic physical therapy settings audiotaped the entire course of treatment sessions for one patient. A total of 173 sessions were audiotaped. Each incidence of the interaction was rated within one of the five categories on a checklist for patient education developed by Sluijs. The second phase of data collection involved administration of a questionnaire to the patients, therapists, and their supervisors to compare evaluations of informal patient education to actual behavior. Correlational techniques, t-tests, and qualitative analyses were utilized to test hypotheses. The results show that therapist perceptions, supervisor opinions, and patient opinions were incongruent with actual therapist behavior. The greatest number of educational statements were in the categories of providing information regarding illness and home exercise instruction. General health education was the only category where the therapist’s perceptions
correlated with actual behavior. Giving instructions for home exercises was the only categorical area where the patient's report related to the therapist's actual behavior. Despite the minimal number of educational statements, more than 80% of patients indicated that they changed their behavior based on the therapists' patient education. Neither the number of years in physical therapy practice nor entry level degree attained by the therapist were related to the number of educational statements given. Conclusion: This investigation revealed that therapists' perceptions of their behaviors rarely correlated with their actual behavior in audiotaped sessions. Despite the low number of patient education statements given by therapists, patients were satisfied with educational components of therapy.


The purposes of this study were twofold: (a) to evaluate the effects of an 8-week weight loss program on immune function in obese women and (b) to determine whether an additional program of combined aerobic and resistance exercise training modifies the effects of weight loss on immune function. Twenty-five subjects were recruited for this investigation from a larger population (N=64), which had been randomly assigned to 4 treatment conditions: (a) diet; (b) diet plus aerobic exercise; (c) diet plus resistance exercise; and (d) diet plus a combination of aerobic and resistance exercise. Due to time limitations and expense, this study utilized subjects from the groups representing treatment extremes: diet and diet plus combined aerobic and resistance exercise. All subjects received a diet which provided approximately 950 kcal·day⁻¹ (34.2% daily calories derived from protein, 18.4% from fats, and 47.4% from carbohydrates). Subjects in the diet plus exercise group participated in supervised exercise sessions lasting one hour, 3 times per week. After 8 weeks of treatment, there was a significant decrease in body weight and relative body fat in both groups, while fat free mass decreased only in the diet group. Absolute and relative peak oxygen consumption, as well as the duration of the graded maximal exercise stress test, increased only in the diet plus exercise group. Following treatment there was a decrease in both groups in all serum lipid fractions measured (total cholesterol, HDL and LDL cholesterol, and triglycerides), but no change in the total cholesterol/ HDL cholesterol ratio. Both groups experienced similar degrees of relative leukopenia, neutropenia, and lymphopenia following weight loss treatment. After 8 weeks, there was no change in either group in the relative numbers of neutrophils, monocytes, NK cells, pan T, helper T, and cytotoxic T lymphocytes, nor in the helper/cytotoxic T lymphocyte ratio. There was a dissimilar pattern of change in the relative number of activated lymphocytes (CD122+) in peripheral blood, characterized by a decreased proportion in the diet group and an unchanged proportion in the diet plus exercise group. This resulted in a significant difference between groups after 8 weeks of treatment. Spontaneous lymphocyte proliferation was marginally enhanced (p=.063) following treatment, and mitogen-induced lymphocyte proliferation was suppressed, in both groups at Week 8. Exercise training seemed to attenuate the suppression, although this effect was not statistically significant. Changes in spontaneous proliferation were positively correlated with changes in relative number of activated lymphocytes, while changes in mitogen-induced proliferation were positively correlated with changes in relative number of pan T lymphocytes. NK cell activity was suppressed in the diet group and unchanged in the diet plus exercise group following treatment. The change in NK cell activity over time could not be accounted for by changes in relative numbers of NK cells in peripheral blood, but did positively correlate with changes in the proportion of activated (CD122+) lymphocytes. In conclusion, an 8-week hypocaloric diet impaired immune function in obese women as assessed by mitogen induced lymphocyte proliferation and NK cell cytotoxicity. Moderate exercise training reversed the effects of weight loss on NK cell cytotoxicity, but did not attenuate the impairment of mitogen-induced lymphocyte proliferation.


The objective of this study was to investigate the effects of diabetic distal peripheral neuropathy on static posture. From a clinical perspective, this research was designed to determine if the diabetic population with neuropathy presents sway characteristics that indicate a reduced ability to control posture that might possibly lead to an increased likelihood for falls. From a basic knowledge perspective, the unique neurophysiological model that the diabetic individuals with neuropathy represent permitted the estimation of the relative contribution of the somatosensory system to the overall control of posture. Seventeen diabetic subjects with significant neuropathy (ages 40 to 70) were recruited for this study. These neuropathic subjects were matched based on gender, age, weight and height with 17 diabetic individuals without significant neuropathy and 17 nondiabetic subjects with normal cutaneous sensation. The subjects in the two diabetic groups were also matched based on duration of diabetes. All participants underwent an extensive medical screening consisting of somatosensory, functional, visual, vestibular and motor tests. The goal of this screening was to obtain three groups of matched subjects so that the effects of diabetes and diabetic sensory neuropathy on posture could be analyzed separately. Each subject was tested for static postural stability under nine “sensory” conditions where
head position, vision and somatosensory conditions were manipulated. Postural stability was quantified through center of pressure data collected while the subject stood quietly on a force platform. Compared to the diabetic subjects without neuropathy and the nondiabetic subjects, the neuropathic group exhibited significantly greater difficulty maintaining a stable stance position (as indicated by greater excursion and range of the center of pressure signal) for all nine sensory conditions ($p<.01$). In general, no statistically significant differences ($p>.05$) were found for the postural characteristics of the nonneuropathic diabetic subjects and the nondiabetic group. While diabetes per se did not influence posture, these results are strongly indicative of the detrimental effects of neuropathy on the control of balance. Most importantly, this study demonstrated that the somatosensory system accounted for at least 40% of the total control of posture, making this sensory system the most important contributor to balance.

Soderquist, Cherilynn. *A survey of health promotion activities and barriers in small Utah businesses*, 1993. M.S., Brigham Young University (Ronald L. Rhodes). (60pp 1f $4.00) HE 552

The purpose of this study was to determine the percentage of Utah worksites with 25-99 employees that have health promotion activities, and the perceived benefits of and barriers to the implementation or success of those activities. Questionnaires were sent to 700 randomly selected businesses. Of the 257 surveys returned 229 were evaluated. The most frequently offered activities were safety interventions, back care information, drug and alcohol abuse controls, and smoking controls. Reasons for offering health promotion programs included: a reduction in accidents, reduction in disability claims, improved employee morale, and a reduction in health care costs. Most worksites without programs had never considered having a health promotion program.

**RECREATION AND LEISURE**

Alzua, Aurkene. *A life history of a fiddler: a heuristic study of leisure and play*, 1995. M.S., Purdue University (Thomas J. Templin). (45pp 1f $4.00) RC 486

This is the case study of a fifty-eight year old retired fiddler, John Watson. Framed within a phenomenological perspective this thesis uses a heuristic method to study the experiences and meanings that fiddling as a realm of human play and leisure brings to John. The life history approach proves to be a powerful method to study the subjective reality of an individual and that individual’s socialization. Fiddling reveals itself to be an intellectually challenging activity that leads the fiddler toward control and transcendence. Additionally fiddling appears to be a basis of adult socialization and the creation of culture. The study shows how fiddling brings meaning in life to John. A review of theoretical work of the existing literature of leisure and human play confirms fiddling’s place in this realm. In this study play and leisure are shown to be dynamic multidimensional phenomena which change and mutate, ebb and flow, wither and flourish; these all happen in the context of the person’s overall life. Finally the value of both the life history method and the heuristic method in the study of human play and leisure are demonstrated.

Bontigao, Eli N. *Competencies needed to assume the role of Director of Morale, Welfare, Recreation and Community Activities Services*, 1995. Ed.D., Temple University (Michael W. Jackson). (228pp 3f $12.00) RC 487

The purpose of this study was to describe the competencies that military or civilian personnel need to assume the role of Director of Morale, Welfare, Recreation and Community Activities Services on selected military installations in the Eastern Region of the United States. A questionnaire developed by the researcher, based on the related literature, was sent to a panel of experts for modification and validation. The validated questionnaire was sent to 60 selected military installations in the Eastern Region of the United States. A total of 43 completed questionnaires were returned, which formed an overall response rate of 71.66%. The demographic information indicated that there were more civilian directors (56%, 24 out of 43) than military directors (44%, 19 out of 43). Of these, there were 39 male and four female directors. Results indicated that all but four directors who were currently serving in the role as Directors of Morale, Welfare, Recreation and Community Activities Services had baccalaureate degrees or higher. The results also showed that the most common professional levels of experience were recreation leader, sports coordinator, and sports instructor. The competencies needed were categorized under the following headings: (a) Personnel Management, (b) Management Skills, (c) Administration, (d) Communication, (e) Budget and Finance Management, (f) Activities Scheduling, and (g) Public Relations. The categories of administrative competencies needed as perceived by chief administrators differed on the basis of level of experience, gender, and type of personnel. The administrative competencies needed as perceived by chief administrators did not differ on the basis of level of education and military branch.


Few studies have examined the social interaction of individuals with dementia while they visit with family and friends. This exploratory field study used participant observation interviews and three questionnaire forms to
analyze how a leisure activity training program for visitors would increase social and life satisfaction for residents in two group homes. The questionnaires were administered to visitors, staff, and residents. Data were collected by observing visiting behaviors and postvisit emotions of residents. Results of analyses indicated significant importance of family and friends utilizing leisure activities during their visits to improve social interaction and satisfaction for the residents with dementia. The findings also suggest that family and friend involvement with individuals with dementia is an important factor for the maintenance of independence and abilities of the person.

Klarich, Catherine. Gender differences in outdoor recreation participation in Whitman County, 1995. M.S., Washington State University (Alan Bright). (84pp 1f $4.00) RC 489

The purpose of this study was to investigate gender differences in outdoor recreation participation within Whitman County, Washington. Past research in outdoor recreation has shown conflicting results as to the presence of gender differences in outdoor recreation participation patterns. This study proposed that there were significant differences in outdoor recreation participation. Hypotheses stated that men and women choose different outdoor recreation activities. Furthermore, perceived importance was predicted to be different for men than for women. Finally, men and women were hypothesized to spend different amounts of time in outdoor recreation. Data was collected through a mail survey. Of the 1,200 questionnaires sent, 376 were returned in a usable condition. This yielded a response rate of 35.4 percent. Two mailings were completed, but due to monetary constraints a third mailing was abandoned. The study found that there were significant differences in five of 34 outdoor recreation activity choices, even when mediated by age. Additionally, outdoor recreation was perceived as more important by men than by women. However, there was no support for gender differences in the amount of time spent in outdoor recreation. Based on the analysis of the data, it can be stated that Whitman County residents show few gender differences in the type of outdoor recreation activities they choose. Additionally, men perceive outdoor recreation as more important than women. Lastly, men and women do not have differences in the amount of time they spend in outdoor recreation.


The purpose of this study was to compare group perceptions of an area using a naturalness scale comprised of setting indicators identified in the Recreation Opportunity Spectrum land classification system. As areas such as the Hells Canyon National Recreation Area grow in popularity among recreationists, the experience that managers originally intended for users are becoming endangered. Just as the activities and experiences vary between users, so too does the complex matrix of variables which can effect the perception of an area. Questionnaires were distributed in the HCNRA from June 1 to September 15, 1994. Two hundred and ninety-two usable surveys were obtained through the efforts of the survey manager and the US Forest Service. Three variables were tested to gain a better understanding of the perception of naturalness in an outdoor setting: group size, mode of transportation, and specialization. Previous research suggests that the cognitive structuring of external stimuli may differ dramatically between users even when similar ratings are reported. It was hypothesized that no significant differences would occur between subject ratings of naturalness within each of these groups. Results support the hypotheses in all three cases. There were no significant differences between novices and experts and between motorized and non-motorized users. There was also no correlation between group size and the perception of naturalness. Additional refinement and testing of the naturalness scale is needed. Setting indicators identified in the Recreation Opportunity Spectrum may or may not be the same factors which are considered by recreationists when evaluating an area. Further investigation of specialization is also needed to better understand the cognitive process as the activity becomes more centralized to the individual.

Lethlean, Steven C. Profit center analysis within private campgrounds, 1995. M.S., University of Wisconsin-La Crosse (George Arimond). (82pp 1f $4.00) RC 491

A 1990 study conducted on Wisconsin Association of Campground Owners assessed which profit centers other than campsite rentals contributed significantly to campground gross revenue. Detailed financial data were collected from 86 surveys. Correlation analysis was used to determine whether site rental, store, recreation, and supplemental service income contributed significantly to gross revenue. It was found that almost 27% of the total income was generated from sources other than campsite rentals. A rank ordering showed overnight campsite rentals with the largest contribution (73.1% with r²=.843, p<.01) and recreational services with the least (4.2% with r²=.390, p<.01). Retail store sales was a complementary service which contributed 15.1% with r²=.560, p<.01. Spending patterns of campers was compared to profit center revenue. Overnight, seasonal, trailer rental, and cottage/cabin site rental represented a separate segment of camper. It was found overnight campers contributed the most revenue support and best explained the variation in gifts, wood/ice, vending profit center revenues with r² values >.750, <.01. Seasonal campers contributed the least profit center revenue support, although gifts were important as indicated by r²=.520, p<.01. Understanding the
relationship of spending patterns and profit center revenue would aid campground operators in developing effective profit centers.

Melby, Jeffrey D. Intentions, attitude beliefs, social norm beliefs, and past behavior relationships based upon perceived environmental and health factors for participants involved in outdoor land-based trail recreation in Wisconsin, 1994. M.S., University of Wisconsin-La Crosse (R. Daniel Duquette). (56pp 1f $4.00) RC 492

Ajzen and Fishbeins’ Theory of Reasoned Action was used to measure the attitude beliefs, social norm beliefs, and intentions in predicting the correlates of participation in outdoor land-based trail recreation based upon perceived environmental and health factors. Additionally, Ajzen and Fishbeins’ behavioral model was modified to include self-report past behavior as suggested by Manfredo and Shelby (1987). A sample of 75 members of the Wisconsin Wildlife Federation were questioned regarding their intentions to participate in nonmotorized trail recreation, their attitude beliefs regarding participation, the influence of important others in making decisions to participate, and their past behavior in either motorized or nonmotorized land-based trail recreation. It was found that the attitude and social norms accurately predicted intentions to participate in nonmotorized recreation (R=.91). Standardized regression coefficients demonstrated that intentions were influenced more by attitudes (r=.92, p<.01) than by the influence of social references (r=.59, p<.01). The past behavior variable also indicated significant correlation to the attitude (r=.29, p<.05) and social norm (r=.26, p<.05) components within a modified model. This supports findings by Manfredo and Shelby (1987) on the validity of self-reported past behavior in studies of attitude-behavior relationships. Although significant differences using the intention and past behavior variables were found, further investigations using a larger sample size are needed. This study suggests that there are both natural environment and health needs factors which participants in outdoor trail use consider when determining motorized versus nonmotorized uses of land-based trail recreational sites.

O’Fallon, Sean P. Factors contributing to the development and transition of physical leisure activities for secondary level individuals with mild to moderate cognitive disabilities, 1995. M.S., University of Wisconsin-La Crosse (Patrick DiRicco). (85pp 1f $4.00) RC 493

School professionals (N=23) and individuals with mild to moderate cognitive disabilities (CD) (N=18) were questioned concerning the leisure curriculum taught during secondary education. School professionals surveyed were from the fields of special education, adapted physical education, and regular physical education. Subjects with CD exited secondary school between 1989-1991. The survey and interviews gathered information on leisure activities taught and what leisure activities the individuals are currently participating in. Percentages summarized the data, and the Fisher exact test was used to assess their equality. Community size and availability of leisure facilities affected both what was taught to the Ss with CD and how professionals could teach leisure skills. Two factors that appeared to affect leisure activity in postsecondary life were lack of transportation and lack of time. Eighty-three percent of the Ss were engaged on a regular basis in 2 or more leisure activities even though in some cases they were not the same activities learned in school. While the professionals stated that they attempted to follow IEP goals for leisure education, the actual activities taught were limited by the facilities available in schools and communities. In addition, there appeared to be a lack of frequent collaborative planning with community personnel. Further investigation is needed to discover actual reasons for the lack of collaborative planning.

PSYCHOLOGY

ANXIETY


The purpose of the study was to examine the effects of nonhumorous and humorous teaching methods on anxiety and performance of beginning riflery students. It was hypothesized that the students receiving the humorous method would report a lower level of state anxiety and realize a higher level of performance than the group receiving the non-humorous method and a control group. The students were taught the prone shooting position and the safety and range procedures for the National Rifle Association 50-foot smallbore target shooting course. Two experimental groups and one control group were used for the study which was conducted over five instructional sessions. The first experimental group received instruction in a non-humorous manner, the second group received instruction which was delivered with humorous illustrations, smiling and jokes. The control group was composed of experienced shooters and this group did not receive instruction. Evaluation of anxiety was achieved by administering the State Trait Anxiety Inventory (STAI) for each of the five days. The two experimental groups performed this assessment following instruction and just prior to shooting. The control group completed this assessment immediately prior to shooting. The STAI Form which measures trait anxiety was administered to all subjects at the onset of the study. Evaluation of shooting performance was achieved
by recording 10 relays fired in the prone position. Three 
hypothesis were designed to test the proposition that a 
humorou teaching method would reduce state anxiety 
among beginning riflery students and enhance perform-
ance. Hypotheses were tested by implementing a 
factorial analysis of variance for repeated measures. 
Quantitative findings failed to support the hypothesis. This 
may have been due to experimental procedures, sample 
size or other research limitations.

Page, Stephen J. Effects of an imagery program on female 
college swimmers’ perceptions of anxiety and precompetitive 
state anxiety levels, 1995. M.S., Ball State University (Valerie 
K. Wayda). (97pp 1f $4.00) PSY 1824

The purpose of this study was to measure the effects of an 
imagery session on intercollegiate female swimmers’ 
precompetitive state anxiety levels and on perceptions of 
 Need for an imagery program on female college swimmers’ 
perceptions of anxiety and precompetitive state anxiety levels, 1995. M.S., Ball State University (Valerie K. Wayda). (97pp 1f $4.00) PSY 1824

The purpose of this study was to measure the effects of an imagery session on intercollegiate female swimmers’ precompetitive state anxiety levels and on perceptions of anxiety. A switched replication design was utilized in which twenty-two female intercollegiate swimmers were administered the Competitive State Anxiety Inventory 2, CSAI-2 (Martens, Burton, Vealey, Bump, & Smith, 1990) and the Competitive Anxiety Perception Scale, CAPS, (Murray, 1989) weekly over the course of five weeks. Subjects were then randomly exposed to an imagery session during this period. Although descriptive data showed decreases in subjects’ levels of A-state, a 2x2 ANOVA revealed no significant differences between subjects’ PRE and POST scores. The observed decreases in A-state, although nonsignificant at the .05 level, warrants future research with a larger sample size. Additionally, the nonsignificant change in CAPS suggested that one’s perceptions of anxiety may be learned at an early age and, therefore, not easily modified. It is suggested that future researchers attempt to identify those factors which mediate perceptions of anxiety.

Smethurst, Christopher J. Performance catastrophes: a 
cognitive approach to testing the hysteresis hypothesis, 1994. 
M.S., University of North Carolina at Greensboro (Daniel 
Gould). (161pp 2f $8.00) PSY 1830

The relationship between state anxiety (A-state) and 
athletic performance has demanded much attention in the 
sport psychology literature. Recently it has been suggested (Fazey & Hardy, 1988) that the anxiety-performance relationship is best described in terms of how cognitive and somatic A-state interact to affect performance. One model used to depict the A-state-performance interaction is a cusp catastrophe (Thom, 1975). The purpose of this investigation is to test the following three predictions of the cusp catastrophe model: (1) Only under conditions of high cognitive A-state will performance follow a different pathway when somatic A-state is rising than when it is failing—The Hysteresis Hypothesis; (2) Each subjects best performance will occur in the High Cognitive A-State condition; (3) Each subjects worse performance will occur in the High Cognitive A-State condition. The subjects were 8 male (age 19-26-years) tennis players with four or more years competitive experience and held a United States Tennis Association (USTA) National Rating of 4.5 or above. Prior to testing, each subject’s cognitive A-state was measured using the Competitive State Anxiety Inventory-2 (CSAI-2). The Time to Event paradigm (see Hardy & Parfitt, 1990) was employed to create the High and Low Cognitive A-State conditions. In each of the cognitive A-state conditions the subjects were exposed to a computer generated step-wise increasing then decreasing threat of electric shock. While no shock was possible two trained experimental confederates enacted receiving a shock at several instances during the testing. After each increment in threat of electric shock the subjects somatic A-state was measured using the somatic scale of the CSAI-2 (CSAI-Som). It was while anticipating the pending threat of electric shock that the subjects performed five tennis second services to a graded service box. The results showed that two significantly different cognitive A-state testing conditions were obtained (Wilcoxon T-value=0.00, p.<.01). The only significant change in somatic A-state was experienced in the High Cognitive A-state condition when somatic A-state was rising (F(187)=14.40, p.<.007). When testing the Hysteresis Hypotheses a Direction by Trial interaction was observed (F(642)=3.09, p.<.01) not the predicted Condition by Direction by Trial interaction. There was no significant difference in the subjects’ best scores in the High, when compared to the Low, Cognitive A-State condition. The between cognitive condition comparison of the subjects worse scores did approach significance (t(47)=1.689, p.<.07). It was concluded that this investigation failed to support any of the Catastrophe model predictions. However, some trends in the data were found, which may suggest that the failure to prove supporting evidence was due to experimental inadequacies. Methodological problems encountered during this experiment were discussed and possible solutions to these problems suggested. Direction for future researchers exploring the Catastrophe Theory predictions of the anxiety-performance relationship are forwarded.

ATTITUDES AND VALUES

Cavanaugh, Cindy A.M. Student attitudes toward physical 
activities in physical education skill and fitness for life courses, 
(119pp 2f $8.00) PSY 1803

The purpose of this study was to determine if attitude toward physical activity differed between students who were enrolled in Physical Education Fitness For Life (FFL) and Physical Education Skill (PES) classes. A second purpose of this study was to determine if attitude differed by class rank, by gender, by class and class rank, or by
class, class rank, and gender of the students. Attitude was measured by using the Kenyon Attitude Toward Physical Activity DW Questionnaire (ATPA DW). Potential subjects (n=722) were classified by class (FFL or PES), class rank (underclassman, upperclassman) and gender. Twenty subjects were randomly selected for each of the eight cells formed by these variables. An ANOVA (2 x 2 x 2) was applied to the total score and the six dimension scores of the ATPA DW. The alpha level for all statistical tests was .05. Class rank was statistically significant for the total score (F=4.49, p<.04). Statistical significance for the six dimensions was as follows: (a) class—Health and Fitness (HF) (F=4.41, p<.04) and Catharsis (CA) (F=5.40, p<.02); (b) class rank—Aesthetic Experience (AE) (F=5.21, <.02); and (c) gender—Pursuit of Vertigo (PV) (F=11.68, <.00), AE (F=10.01, p<.00), and Asiectic Experience (AS) (F=10.04, <.00). No statistical significance was found for the Social Experience dimension. Few statistically significant differences in attitude toward physical activity were found. The findings in this study were generally supported by previously published research. Thus, the researcher concluded that attitude toward physical activity, as measured by the ATPA DW, did not differ between groups formed by class, class rank, gender, class and class rank, or class, class rank and gender. INDEX WORDS: Attitudes, Kenyon Attitude Toward Physical Activity (ATPA), Physical Education Basic Program, Physical Activity

Higgins, Kelly J. A survey of the perceptions, attitudes, and relationships of five different university populations concerning the drug testing of college student-athletes, 1995. Ed.D., Temple University (Michael W. Jackson). (256pp 3f $12.00) PSY 1811

The purpose of this study was to examine attitudes and perceptions of faculty, athletic staff, nonathletic staff, student-athletes, and nonathlete students toward drug testing of collegiate student-athletes. A questionnaire, based upon a previous study, was developed and administered to 762 potential subjects—150 faculty, 21 athletic staff, 150 nonathletic staff, 241 student-athletes, and 200 nonathlete students at the selected university. Returned questionnaires numbered 453, 93 from faculty (22 identified their status as both faculty and staff and a separate category was developed), 13 from athletic staff, 80 from nonathletic staff, 145 from Student-athletes, and 122 from nonathlete students. The results of the study indicated that 45.7% of faculty, 52.4% of faculty/staff, 69.3% of athletic staff, 57.2% of nonathletic staff, 85.5% of student-athletes, and 77.9% of nonathlete students agreed or strongly agreed with the concept of making student-athletes subject to drug testing. Athletic staff, student-athletes, and nonathlete students were generally more in agreement with making nonathlete students subject to drug testing than were faculty, faculty/staff, and nonathletic staff. Other than athletic staff, results indicated a strong positive correlation between age and attitudes toward the drug testing of student-athletes among those 26 to 35 years (rho=.4942), 36 to 45 years (rho=.5192), 46 to 55 years (rho=.4724), and 56 years or older (rho=.5150). Older respondent groups were more likely to respond that constitutional rights and participant health and safety were important influences of their attitudes. All subgroups indicated some action should be taken after an initial drug test failure. The three most common and prevalent actions agreed, or strongly agreed to were continued participation on condition of entering a drug counseling program, the student-athlete’s choice of dismissal from the team or mandatory counseling, and suspension from the team until completion of a drug counseling program. Constitutional rights and participant health and safety were the two most important factors/influences on the individual attitude concerning the drug testing of student-athletes for faculty, faculty/staff, and nonathletic staff. The two most important factors/influences for athletic staff were participant health and safety, and integrity of college sport. The two most important factors/influences for student-athletes and nonathlete students were integrity of college sports, and to insure fair competition.

Hunt, Jeffrey D. The impact of a daily physical education program on students’ attitudes towards, and participation in, physical activity, 1995. M.H.K., University of British Columbia (Alex Carre). (130pp 2f $8.00) PSY 1812

The goal of this study was to examine selected aspects of daily physical education programs in order to assess their relative student behavior and attitude outcomes. Specifically, the purpose of this study was to determine if students involved in a program of daily physical education (DPE) exhibited more positive attitudes towards, and participation in, physical activity when compared to their peers involved in a non-daily physical education (NPE) program. It was hypothesized that the students involved in a daily physical education program would reap the benefits of regular physical activity to a greater degree than the non-daily physical education students and therefore develop a more positive attitude towards physical activity. Furthermore, by participating in physical education every day the students would see that physical activity is a valuable component of daily living. This recognition would serve as a foundation for a more positive attitude towards physical activity. Based on research that suggests that one’s attitude will help predict his or her participation in physical activity (Smoll, Schutz, & Keeney, 1976) it was also hypothesized that the student’s involved in a daily physical education program would exhibit greater levels of participation in physical activity in general. A total of 295 students (N=143 NPE students and N=152 DPE students) within two British Columbia school districts were used as subjects for this study. The subjects from both program groups were selected from classes taught by specialist teachers and were enrolled in schools that were similar in philosophy, facilities and socioeconomic status. The
student’s attitudes were assessed using the Children’s Attitude Towards Physical Activity Inventory (CATPA) (Schutz, Smoll, Carre, & Mosher, 1985). This inventory is based on Kenyon’s (1968) early theoretical model that suggests attitude towards physical activity is a multidimensional construct consisting of eight sub domains. The levels of participation in physical activity were assessed using the following two inventories: 1) The Leisure Time Exercise Inventory (Godin & Shephard, 1985) which has been validated and has shown strong test-retest reliability since its development. 2) The Physical Activity Questionnaire for Children (PAQ-C) (McGrath & Bailey, 1991) which is a more contemporary inventory provides detailed information regarding physical activity levels and patterns. The results from the multivariate analysis of variance show an non-significant difference, F(8,286) is 1.107, p<.369, between the DPE and NPE student’s attitudes towards physical activity. However, consistent with other research there was a significant multivariate F ratio, F(8,286) is 6.831, p<.001, for the gender main effect. There were two attitude domains (vertigo and aesthetic) that were responsible for the overall gender difference. The univariate F ratios suggest that the males had a more favorable attitude towards the risk taking and thrill aspects of physical activities when compared to females. Also consistent with past research it was determined that females had more favorable attitudes towards the aesthetic nature of physical activities. There was also a non-significant Program and Gender interaction suggesting that the differences between the males and females were generally the same for each program. With respect to the levels of participation in physical activity, both inventories used were able to significantly differentiate between the Program and Gender groups. Multivariate analysis using both inventories showed significant F ratios, F(2, 292)=11.37, p<.001 for the Program main effect and F(2,292)=22.654, p<.001 for the gender main effect. The results suggest that the students involved in the daily physical education programs were more active than the students in non-daily physical education programs. Without any significant differences between the attitudes towards physical activity of each Program group and the fact that the attitude-involvement relationship was weak, r=.16 for males and r=.10 for females, it is difficult to explain the level of participation differences between the two program groups. It may be that the students involved in the daily physical education program became conditioned to participate more in physical activities because of their regular physical education classes. In other words, physical activity became habitual for them and possibly because their regular involvement they recognize the value and benefits of physical activity to a greater degree. Non significant differences in the attitudes towards physical activity between the two Program groups does not support this claim however. Examination of the gender differences determined that the females were more involved than males in mild activities yet males were more involved than females in strenuous activities. The gender differences in physical activity levels and patterns identified in this study have been well established in the literature (Shephard, 1983). There was a non significant Program by Gender interaction. Analysis of the relationship between the two inventories gives preliminary support for the use of the PAQ-C inventory (McGrath and Bailey, 1990). It also suggests that both of the inventories primarily provide information on the levels of physical activity of moderate and strenuous intensities. The findings of this study provide more support for daily physical education programs but researchers are encouraged to more closely examine the role of daily physical education programs on a number of related student outcomes because the results of this study are somewhat inconclusive. It is suggested that more attention be paid to both the specific curricular and instructional components of the program that affect the quality of the physical education experience prior to implementing the program on a daily basis.

Idowu, Ikudabo O.S. Attitude of recreation leaders toward supervision in Indiana state prisons, 1995. M.A., Ball State University (John E. Reno). (72pp 1f $4.00) PSY 1813

The purpose of this study was to investigate the attitude of recreation leaders toward supervision. The attitude of recreation leaders toward supervision was assessed through a questionnaire which dealt with attitude toward their recreation coordinators’ supervision. The subjects chosen for this study were current professional recreation leaders working for the Indiana Department of Correction in the men, women, and juvenile correctional facilities. The majority of the recreation leaders displayed negative attitudes toward supervision. The findings of this study may be used by recreation coordinators to modify their supervisory behavior and /or recreational environment in order to facilitate recreation leaders acquiring positive attitudes toward their supervision.

Martin, Scott B. NCAA Division I athletes’ attitudes toward seeking sport psychology consultation, 1995. Ph.D., University of Tennessee, Knoxville (Craig A. Wrisberg). (208pp 3f $12.00) PSY 1819

Every year an increasing number of sport psychology practitioners work with athletes, coaches, and teams in the field (Murphy & Ferrante, 1989). Despite the growth in the number of active consultants, many athletes and coaches remain reluctant to utilize sport psychology services (Ravizza, 1988). Little is known about how athletes themselves feel about sport psychology consultants (SPCs), particularly those from cultural backgrounds different than that of the consultants (Anshel, 1990). Recently, Wrisberg and Martin (1994) found that African-American athletes may have less favorable perceptions of SPCs than do Caucasian athletes. Thus, the major purpose of this study was to develop and standardize a questionnaire to measure athletes’ attitudes toward seeking sport psychology.
consultation. A 50-item questionnaire was developed and administered to 48 African-American (14 female and 34 male) and 177 Caucasian (79 female and 98 male) athletes ranging from 17 to 23 years of age at an NCAA Division I university. Principle components factor analyses were conducted to extract initial factors, followed by varimax orthogonal rotation. The results revealed three dimensions of athlete attitude toward sport psychology consultation representing 35% of the variance: stigma tolerance, confidence/recognition of need, and personal openness. A secondary purpose of this study was to determine whether attitudes toward seeking sport psychology consultation of athletes differed as a function of gender and race. A MANOVA and follow-up univariate analysis was performed on the factors to identify which ones maximized differences among race and gender groups. Factor 1, stigma tolerance, was significant for race, $F(1, 210)=19.36$, $p=.0001$, $\omega^2=.07$; and for gender, $F(1, 210)=44.13$, $p=.0001$, $\omega^2=.16$. No other significant effects were obtained. However, 2 (Gender) x 2 (Race) ANOVAs were performed on each item of the questionnaire which revealed that male athletes exhibited a greater stigma towards sport psychology, whereas, females viewed a sport psychology consultant as someone that could help them enhance their athletic performance. Moreover, compared with Caucasian athletes, African-American athletes were less likely to think that an SPC could help them perform better, were more apprehensive about going to an SPC because they feared they would be harassed by teammates or receive a bad reputation, were less likely to self-disclose, were less committed to following the instructions of an SPC, and were more comfortable with an SPC who was of the same race and gender as them. African-American male athletes were less sure what an SPC actually does than were African-American female athletes and Caucasian athletes. Implications for consultants working with athletes and recommendations for further research on cross-cultural consulting are discussed.


Through many years, researchers have determined that studies related to sport are valuable in understanding attitudes of Americans. Several studies have been established to analyze and predict Americans’ attitudes in general. The Miller Lite Report on American Attitudes Towards Sport (1983) was the benchmark study that is still believed to be the most comprehensive of its kind ever conducted in the United States. A few studies have been conducted regarding Korean attitudes toward sports and physical education. However, these studies extended to all age groups, so it was necessary to examine the most recent generation’s attitudes. The investigation compared the current generation’s attitudes toward intercollegiate sports in both countries. Two hundred ninety subjects were randomly selected to participate in this investigation. The results of nations and genders were compared and analyzed, and then reported in tables and graphs. All subjects participated by responding to questionnaires. In general, male subjects had a higher frequency of participation in sports than females who tended to watch more than participate. American female subjects were more aggressively interested in sports than Korean female subjects. Overall, culture could affect attitudes of college students toward intercollegiate sports programs. However, gender is a stronger factor in affecting college students’ attitudes toward intercollegiate sports programs.

**BEHAVIOR ANALYSIS**

Akker, Kevin V. *Athletic participation and the academic achievement of athletes*, 1995. M.A., Ball State University (John E. Reno). (45pp $4.00) PSY 1797

The purpose of this study was to compare the academic achievement of student-athletes at Huntington College to non student-athletes using the mean grade point average (GPA). A sample of 753 subjects was selected from the records data base and assigned by gender to groups as student-athletes and non student-athletes. The sample was further separated into two categories by year of entry. Data were analyzed using Analysis of Co-Variance (ANCOVA). ANCOVA revealed no significant difference between student-athletes and non student-athletes mean GPA when tested at the $p .05$ level. A three-way interaction was found to exist among the year, gender and the student-athlete/non student-athlete variable. Unadjusted mean GPA revealed student-athlete groups performed better than did the non student-athletes. Male student athletes outperformed the male non student-athlete group and the female student-athletes surpassed the other three groups. Adjusted mean GPA disclosed a poorer academic performance by female student-athletes compared to the non student-athlete group. A rise in mean SAT scores and mean GPA was observed, which was indicative of increased student academic potential and consistent improvement of academic performance.

Beatha, Edward E. *Various training methods and how they affect [i.e. affect] mood states*, 1994. M.A., Ball State University (Valerie K. Wayda). (49pp $4.00) PSY 1800

Despite the abundance of research examining the benefits of both interval and continuous training methods, very little research had been completed investigating the mood states that encourage or discourage the runners utilizing these training methods. The purpose of this study was to compare the effects of interval training and continuous training on mood states. Thirty college aged men and women were randomly divided into two groups. One
The primary purpose of this investigation was to determine the meaning as well as the benefits and costs of serious running. An additional purpose was to ascertain whether serious runners considered their running leisure. Twenty-four runners with a wide range of demographic characteristics who regularly ran races of 5K or more were selected for in-depth interviews. The runners in this study began and continued running for health and fitness, competition, and other personal and social reasons. Sense of accomplishment was not only the most prominent ‘durable’ benefit identified, but was also a significant part of the personal meaning of running. Generally, running meant feeling better about who they were and the kind of person they were going to be. It seemed that runners developed an identity and that running was incorporated into their life-styles as a strategy for improving the overall quality of their lives. The majority of informants in this study indicated that they felt “addicted” to running or exercise to some degree and that they viewed this as being positive and leading to psychological well-being. However, this commitment to running was not without costs. Runners identified injuries as the number one cost although its significance was considered to be relatively minor. All female runners were afraid for their safety and one-quarter were fearful of being attacked, although the issue of endangerment did not normally prevent them from running. Runners characterized their running for fun, with a friend or to alleviate stress in one’s free time as leisure. Road races and interval track workouts, although freely chosen and performed in their free-time were perceived not to be leisure. Nevertheless, it appears that the amount of commitment, effort, and perseverance, as well as the discomfort and occasional pain associated with road racing is what separates the serious runner from their less serious counterparts; these are some of the same characteristics that Robert Stebbins (1992) used to differentiate serious leisure from casual or unserious leisure. Index Words: Running, Serious Leisure, Positive Addiction.


The female athlete triad disorders have recently emerged as a potential morbidity of overzealous exercise and a culturally mediated preoccupation with thinness. This study utilized a questionnaire patterned after the Michigan State University Weight Control Survey to examine the menstrual function, body image, weight history, activity level, weight control methods, and season injuries of 17 cross country (CC) and 8 volleyball (VB) athletes and determine the prevalence of disordered eating and menstrual dysfunction. Ss completed the survey and were hydrostatically weighed at the beginning and end of their respective seasons. Survey responses were anonymous. Statistical treatment of data indicated no significant (p>.05) differences between the prevalence of disordered eating behaviors and menstrual dysfunction between teams and testing times. The prevalence of disordered eating was lower than expected, possibly due to subjects’ reluctance to risk exposure and the influence of social desirability. Prevalence of menstrual dysfunction in both groups was similar to figures published for college females. Low prevalence of menstrual dysfunction in CC may be attributed to their comparatively high body fat and low mileage. The small, potentially biased sample and subject withdrawal contributed to the lack of significant results.

Medbery, Russell E. The use of imagery as a strategy for arousal control with youth soccer players, 1995. M.S., Purdue University (Joan L. Duda). (130pp 2f $8.00) PSY 1821

The effectiveness of imagery as an arousal control has received little attention in youth sports. The purpose of this study was to examine the impact of an arousal/activation control strategy for young athletes that focused on controlling their pregame readiness. A single subject multiple-baseline across subjects design was employed with 15 male soccer players (11-13 years old, x=12.13) who were all members of the same elite travel team. While there were no significant group findings for any of the dependent variables (i.e., imagery ability, cognitive and somatic anxiety, pregame readiness, objective performance, and perceived performance), objective performance improvement was observed in the case of six of the players. Both measures of pregame arousal changed for the individual players at the time of intervention.

Systematic observation instruments have been developed to provide valid and reliable information on key elements of effective instruction in the physical education and sport environment. The instruments used in research on verbal behavior, however, (Lacy & Darst, 1985: Segrave and Ciancio, 1990) do not fully describe instructional style and, therefore, any behavior modification based on such assessment is limited to the scope of the instrument. The Coach Analysis Instrument 11 (CAI (II), (More et al, 1992)), was designed to provide a more complete description of the verbal skills required for discriminative behavior, such that this explicit information could be used as a means of analyzing and modifying aspects of ineffective behavior. The proposed study tested the utility of the CAI (II) as part of an intervention strategy designed to modify behavior. Four coaches were observed and analyzed across twelve practice sessions. Coaches A, B and C received intervention feedback through CAI (II) data, where selected behaviors were highlighted for discussion, and video-tape evidence was used to illustrate discussion points. Coach D was provided with video tapes of his own performance, and told to formulate and implement any of his own recommendations. The CAI (II) data is primarily quantitative, so target values were created for the different dimensions of verbal behavior. This benefited the coaches in interpreting their effectiveness and provided a reference to evaluate the magnitude of change. Written journals and audio-tape recordings were also utilized to promote insight into the complexity of verbal behavior and the “human factors” (e.g., relationship with players, attitude to researcher) that affect behavior modification. Change was quantified according to the “organizational” and “instructional” components of the CAI (II). Interpretation of cumulative values for organizational effectiveness revealed marked improvements in Coach A and B’s behavior following intervention, and marginal improvement in the clarity and conciseness of Coach C. Marginal change was also reported in the organizational behavior of Coach D, although this was not maintained. Instructional effectiveness was assessed by time-series analysis. according to recognized criteria (Grant, Ballard and Glynn, 1990; Kadzin, 1978). There is evidence from each behavior dimension that change can occur and be maintained as a result of exposure to the CAI (II) intervention strategy. However, this is clearly contingent upon the coach understanding what is asked of him, and remaining focused and committed to changing these particular behaviors. The analysis of Coach D’s behavioral change suggests there are limitations to the sensitivity of discretionary viewing, as only two dimensions of behavior were identified for, and resulted in, positive change. The results of this study provide support for Locke’s (1984) contention that behavior modification can occur by using data as direct feedback, as reinforcement, and as information in the form of recommendations. However, the study also illuminates several factors that can negate the modification and maintenance of verbal coaching behavior.

Page, Gary W. The relationship between consistent aerobic exercise and depression in college age students, 1992. M.S., Brigham Young University (Brent Q. Haven). (62pp If $4.00) PSY 1823

The relationship between regular aerobic exercise and depression levels among college students was examined. Students were questioned about the frequency and duration of the aerobic exercise in which they participated, before they completed a 30 question yes-or-no self-response depression survey. Three hundred fifty-four college students currently enrolled and attending winter semester 1992 at BYU completed a questionnaire form, and were the subjects for the study. From the information provided by each student, three exercise group classifications were created. The aerobic group included those students reporting three or more exercise sessions per week, the active group included those reporting one to two exercise sessions per week, and the inactive group was composed of those students reporting less than one exercise session per week. All exercise groups maintained consistent exercise patterns for at least 3 months prior to the study. The results confirmed the research question. Students reporting more frequent aerobic exercise sessions per week had lower depression scores on the GDS—they answered less depressively than their more sedentary peers.

Pero, Suzanne F. Development, implementation, and evaluation of an educational program in sport psychology for athletic trainers, 1995. Ph.D., Temple University (Michael L. Sachs). (284pp If $12.00) PSY 1825

In response to the 1994 role delineation study conducted by the National Athletic Trainers’ Association (NATA) which recognized that athletic trainers must be knowledgeable in the area of the psychology of sports injuries, a sport psychology workshop was developed that was specifically designed for athletic trainers. The five-hour workshop was an overview of sport psychology as related to athletic training, how sport psychology techniques could be used to prevent injury, and how to facilitate the rehabilitation process once an injury had occurred through utilizing the psychological skills training techniques (e.g. goal setting, imagery, self talk, relaxation) in conjunction with the injury rehabilitation program. The workshop was presented as a preconference workshop at the Eastern Athletic Trainers’ Association annual meeting on January 7, 1995. Any athletic trainer who could not attend the workshop had the opportunity to participate through a home study option. The workshop was approved by the NATA for .5 Continuing Education Units. The athletic trainers were given a short Sport Psychology Knowledge Test developed specifically to correspond with the topics covered in the workshop prior to and at the completion of the workshop. A total of 58 athletic trainers participated in this study: 26 attended the workshop and 32 participated through the
The current study examines cheerleading, a sport that has been excluded from most studies that focus on eating disorders. Female cheerleaders are expected to be at risk for developing eating disorders due to pressures that may exist, such as weight limits to participate, the emphasis on stunting, and revealing team uniforms. In the current study cheerleaders (73 college females and 84 high school females) completed the Eating Disorder Inventory (EDI), the Social Physique Anxiety Scale (SPAS), and CHEER, a measure developed by the author to identify pressures related to eating attitudes and behaviors of college and high school female cheerleaders, 1995. M.S., University of North Carolina at Greensboro (Diane Gill). (142pp 2f $8.00) PSY 1826

Twenty-eight National Collegiate Athletic Association Division I intercollegiate women’s volleyball teams from the northeastern United States scheduled for competition during the 1990 through 1993 seasons were directly observed by the investigator for play-by-play data. This was combined with video tape recording of the time between points to provide the output for statistical analysis in this investigation. The data set included 44 matches (168 games) which yielded 403 time-outs for analysis. Fourteen of these matches (48 games, 65 time-outs) were video taped for time stamping. Points in-a-row, score differential, time between points, and type of point-ending plays were the variables analyzed in order to investigate the effect time-outs had on momentum. These variables were recorded prior to and following time-outs in competitive volleyball. Results indicated that points in-a-row prior to a time-out were significantly greater than following a time-out. Score differential proved to be statistically significant with the greater score differences occurring post-time-out. Time between points did not prove to be significantly different prior to and following time-outs. The final variable analyzed was type of point-ending play, with kills and errors accounting for 75% of the plays observed. An informal survey of coaches had indicated shifting momentum as a primary reason for calling time-outs during play. The results of this investigation gave support to the perception of momentum based on micro-level variables. Future investigations need to expand the knowledge base of those variables that influence the perceptions of coaches and participants.

Tobias, Julie A. Desperate measures: eating disorders in female high school and college athletes, 1994. M.A., Ball State University (John Reno). (64pp 1f $4.00) PSY 1832

The purpose of this study was to examine the clinical characteristics, epidemiology, and some current theories of etiology of eating disorders in female athletes. Two of the major disorders of concern to today’s student athlete were anorexia nervosa and bulimia. Anorexia was self imposed starvation in an obsessive effort to lose weight and become thin. Bulimia was characterized by secretive binge eating episodes usually followed by purging in the form of self-induced vomiting or using laxatives or diuretics. Subjects were 125 females between the ages of 14-21 years of age. Thirty-seven were in high school and 38 were in college; all of whom participated in sports. Twenty-five high school and 25 college students served as the control group. The subjects were given the Eating Disorder Inventory (EDI). The questionnaire consisted of 64 questions which measured a variety of attitudes, feelings, and behaviors. The EDI consisted of eight subscales. Body Mass Index (BMI)
was computed. Findings indicated that none of these athletes had scores indicative of the constellation of disturbances in eating patterns and personality attributes seen in anorexia nervosa and bulimia. Rather, results suggested that the typical high school and college female athlete falls into the normal range with regard to body mass and eating patterns. The competitive female cross-country runner actually may be at slightly less risk for body dissatisfaction than her nonathlete counterpart, whereas the gymnast may be at somewhat greater risk for weight preoccupation.

Udry, Eileen M. *Examining mood, coping, and social support in the context of athletic injuries*, 1995. Ph.D., University of North Carolina at Greensboro (Daniel Gould). (183pp 2f $8.00) PSY 1833

It has recently been estimated that approximately 17 million injuries occur each year in the United States as a result of individuals’ participation in sports or physical activity (Booth, 1987). Unfortunately, there is a dearth of empirically derived knowledge about the psychological processes and behavioral outcomes that follow athletic injuries (Brewer, 1994). This research focused on the psychosocial variables associated with athletic injuries, rehabilitation adherence and physical recovery. Specifically, time changes in mood, coping strategies, and social support were examined following the occurrence of anterior cruciate ligament (ACL) injuries among 25 recreational athletes. In addition, the above mentioned psychosocial variables were also examined as predictors of injury rehabilitation and recovery. Using a repeated measures design, individuals who experienced ACL knee injuries and underwent surgery completed a battery of psychological assessments at five times: Pre-surgery, 3, 6, 9, and 12 weeks Post-surgery. A series of repeated measures MANOVAs revealed statistically significant time changes in mood disturbances, three types of coping (instrumental, negative emotion, and palliative), and rehabilitation adherence with effect sizes ranging from .13 to .22. In general, mood disturbances, instrumental coping, negative emotion coping, palliative coping, and adherence were highest during the three weeks following surgery but declined significantly from weeks three through nine. Significant time effects were not observed for social support or the use of distraction coping, although individuals’ perceived satisfaction with their social resources was lowest during the three weeks following surgery. To examine whether mood, coping, and social support were significant predictors of adherence, a series of multiple stepwise regression analyses were conducted. None of the above mentioned variables were shown to be significant predictors of adherence. Instead, the most reliable predictor of adherence at weeks 6, 9, 12 Post-Surgery was adherence from the previous assessment period.

**MOTIVATION**

Coyle, John J. *An analysis of the motivations for participation in extracurricular activities and their relationships to academic achievement*, 1995. Ed.D., Temple University (Ira Shapiro). (131pp 2f $8.00) PSY 1805

The purpose of this study was to examine the relationship between motivation for involvement in extracurricular activities, continuing motivation, and academic achievement. Students enrolled in public, private, and parochial high schools located in suburban Delaware County, Pennsylvania participated in the survey (N=508). Principal components analysis was used to examine underlying dimensions in the 29 motives for extracurricular involvement. Results indicated eight motive categories for involvement with the dimension “to have fun” receiving the highest mean importance ranking. Analysis of variance results indicated that females reported higher service motives than males; while males reported being more motivated for participation by goal specific reasons. Minority students who participated in sport activities also reported higher goal specific motivations than did their counterparts. All students reported that they were motivated to perform better academically because of their extracurricular involvement; however, a statistically significant correlation existed between grade point average and continuing motivation for non-sport participants only. Findings are discussed in terms of their implication for student involvement in extracurricular activities.


The purpose of this study was to examine psychological factors associated with T-shirts and runners. A secondary purpose of this study was to gather information about T-shirts to assist race directors, sponsors, running clubs, media, and other interested organizations, to more effectively market their races to runners. A questionnaire was developed from an original draft of 25 questions, which was sent to an expert panel of 15 members for review. It was then revised and expanded to 32 questions. A 32-item questionnaire, along with an introductory cover letter, was distributed to subjects who were members of one of four electronic mail discussion groups (Dead Runners Society (DRS), Ultra Distance Runners (ULTRA), Exercise and Sport Psychology (SPORTPSY), and Sport Sociology (SPORTSOC)) (N=2,783). A total of 140 responded (99 (71%) males and 41 (29%) females). The average runner’s age was 36.63 years. Runners had been running for an average of 12.9 years. Males ran an average of 4.9 days per week while females ran an average of 4.7 days per week. Runners were well-educated. A total of 87.2% had at least a bachelor’s degree and 15.7% had...
doctorate degrees. Findings revealed T-shirts had psychological importance to runners. Almost all (133 out of 140, 95.7%) stated that some T-shirts were more important than others. Most runners (127 out of 140, 92.7%) indicated they would not wear a race shirt in a race in which they did not compete. In addition to the psychological factors associated with running and T-shirts, personal records in races, personal achievements, T-shirt design and quality, significant events, and the running subculture were examined. Further areas of research could look at less experienced runners, use of different mailing lists or regions to survey, other sports and specific clothing associated with that sport, male and female issues, different climates, and other “back of the pack” runners. In conclusion, T-shirts were psychologically important to runners.

**MOTOR LEARNING AND CONTROL**

Athey, Douglas D. *The effect of goal setting on pitching in golf*, 1993. Ph.D., University of Southern Mississippi (Sandra K. Gangstead). (115pp 2f $8.00) PSY 1798

This study investigated the effects of goal proximity condition on the performance of a golf pitching task. Subjects (N=65) were randomly assigned by class to one of four experimental groups: short-term goal (n=22), long-term goal (n=15), short-plus long-term goal (n=10), or “do your best” goal (n=18). Following the baseline trial under “do your best” instructions, subjects were tested on the Nelson Pitching Test for three trials under assigned treatment conditions. At the conclusion of the third treatment trial, a post trial on the Nelson Pitching Test was administered to subjects under “do your best” Instructions. After each of the five trials, subjects responded to a questionnaire designed to assess the subject’s perceived degree of effort to the assigned goal and the quantity of practice outside the class setting. A 4 X 4 (Group X Trial) ANCOVA with repeated measures on the trial factor and the baseline performance as the covariate was utilized to determine the effect of goal proximity condition on Nelson Pitching Test performance among subjects. The same statistical design as above was used to determine the effect of goal proximity condition on perceived degree of effort. Results revealed no significant differences between the four goal proximity groups on either the performance of the Nelson Pitching Test (F=0.35, P>.05) or on perceived degree of effort (F=1.66, P>.05). A 4 X 4 (Group X Trial) ANOVA with repeated measures on the trial factor revealed significant group by trials interaction (F=1.95, P<.05) on the reported quantity of practice outside of the classroom. The “do your best” group had significant increases in the quantity of practice from the first trial to the second (HSD=.833, P<.05) and third trials (HSD=.7777, p<.05). A significant increase in the quantity of practice from the first trial to the third trial (HSD=.7727, p<.05) was also evident with the short-term goal group.

Beach, Laurie M. *The effects of self-directed and task-oriented cognitive strategy use for achieving racquetball skills in beginning and advanced players*, 1994. Ph.D., University of Florida (Robert N. Singer). (234pp 3f $12.00) PSY 1799

This experiment was designed to examine the question of whether beginning and advanced racquetball players would benefit more from a self-directed strategy, a task-oriented strategy, or a combination of the two strategies, when executing basic skills and during actual play. Participants (N=80) were assigned to either a self-directed, task-oriented, combined, or control group based on skill level (beginning versus advanced). During the initial meeting, they performed a total of 150 diagonal lob serves to the backside and frontside service courts and executed ten 30 s rallies. Subjects were verbally reminded to use their respective strategies and were requested to fill out strategy-use questionnaires following trial blocks 1, 3, 5, and 8 during both skill tests. Following the rallies, they repeated a total of 30 diagonal lob serves to the backside and frontside and two additional 30 s rallies as retention measures. A final strategy-use scale was completed for both serves and rallies during the retention phases. Approximately 1 week later, subjects returned to the courts to play a modified tournament against three other players with the same skill, but with each representing a different strategy group. They played a total of nine games and completed a final strategy-use scale for modified play. Control subjects completed an additional questionnaire regarding any possible strategy use. Separate ANOVAs were used to analyze both skill tests, the total points scored and won/loss records for modified play, and the strategy-use scales. The results revealed that advanced players performed better than beginners for both the serves and rallies. Regarding the modified play, the task-oriented group won more games and points than the self-directed and control groups. Analysis of the strategy use scales indicated that (1) the combined and self-directed groups consistently scored higher on serves than the control group, and (2) the combined and task-oriented groups scored higher than the self-directed and control groups in modified play. In general, task-oriented strategies appeared to be more useful than self-directed or combined strategies during actual play.

Achievement goal orientations (e.g., task, ego) are suggested to reflect a differential focus on skill mastery and performance outcomes (Duda, 1992). McCullagh, Weiss, and Ross (1989) have further suggested that motivational orientation is an important observer characteristic in the modeling process. The relationship between goal orientations and a focus on form and outcome aspects of a motor skill demonstration was assessed. Novice college students ($n=30$) with low perceived tennis ability viewed several videotaped demonstrations of a correctly performed tennis forehand. Visual recognition and verbal recall accuracy of form and outcome task characteristics were assessed. A canonical correlation analysis revealed a nonsignificant relationship. It appears that motivational orientation may not be an important observer characteristic in the learning phase of modeling. Also, achievement goal orientations may not be associated with a differential focus on task mastery or task outcomes but remain a reflection of divergent processes of success evaluation.

Goginsky, Alesia M. Imagery/physical practice schedules in the enhancement of dart throwing performance, 1992. Ph.D., Pennsylvania State University (David Collins/Bruce D. Hale). (111pp 2f $8.00) PSY 1807

Male and female undergraduate and graduate students ($N=99$) at Penn State were randomly assigned to 1 of 11 specific imagery/physical practice ratio groups in an attempt to determine which practice ratio would facilitate the greatest amount of performance enhancement in a dart-throwing task. These ratio groups included (in percentages of the total practice time of 10 minutes): $0/0$ (no practice), $0/0$ (attentional control), $0/100$, $100/0$, $10/90$, $90/10$, $30/70$, $70/30$, $50/50$, $0/50$, and $50/0$. Both physical and imagery abilities were measured during the prepractice and postpractice testing sessions—physical ability via performance outcome and precision scores, and imagery ability via the Vividness of Movement Imagery Questionnaire (VMIQ) and the Gordon Test of Imagery Control. The Eysenck Personality Inventory (EPI) was also administered during both pre- and postpractice to test whether the personality traits of extraversion and introversion facilitated a discrimination of imagery ability. All subjects, except for those in the no-practice control group, attended a practice session once per week for four weeks. During each practice session, subjects received two of three possible types of practice for a ratio-specified amount of time: imagery practice, physical practice, or a control lecture. Performance was measured during all practice sessions. Appropriate practice questionnaires were administered at the end of every type of practice. ANCOVA and ANOVA statistical analyses revealed no significant differences among the groups for performance enhancement as measured by either outcome or precision scores. However, effect size analyses indicated that the greatest performance enhancement occurred in the group that practiced 30% imaginally and 70% physically. VMIQ and Gordon Test measures of imagery ability did not significantly correlate with EPI results, failing to support the conclusions of previous research.

Ketelaars, Maria A.C. On-line programming in simple movement sequences: an application of the probe reaction time paradigm, 1995. M.S., University of British Columbia (Ian Franks). (130pp 2f $8.00) PSY 1815

The main goal of this experiment was to detect on-line programming as it occurred during the execution of forearm extension movements by including a probe reaction time paradigm within an extension-flexion movement task. The experiment included a primary and a secondary task condition and subjects performed these tasks in both single and dual-task situations. For the primary task in the single task condition, subjects performed forearm extension (E), and two types of extension-flexion movements for which the time between successive extension and flexion movements was varied (i.e., this time period was 50-100 msec (EFS) or 250-300 msec (EFL)). For the secondary task in the single task condition, subjects wore headphones through which an auditory stimulus (i.e., probe) was delivered at seven positions, either before or after the primary task stimulus. The onset of this probe was determined by either an absolute time interval, or by online analysis of EMG and acceleration profile data. Subjects closed their jaw as quickly as possible following the probe. In the dual task condition, the forearm movement and the jaw clench response were performed simultaneously. The reaction times were comparable for E, EFS and EFL movements in the dual task condition, suggesting that subjects programmed the flexion movement during the execution of the extension movement. By combining probe reaction time measures with those from the initial latency period, a more accurate description could be given of where in time these on-line control processes took place. Specifically, the probe reaction times were lengthened when the probe occurred at the end of the extension movement for EFL movements. It appeared that subjects delayed the execution of the jaw clench response until the programming of the flexion movement had been completed and hence the jaw clench and flexion response were initiated concurrently at this probe position (evidenced by EMG activity of the Masseter and Biceps muscles). Subjects appeared to use this same strategy for probes occurring during the pause time for EFL movements and at the point at which peak velocity was obtained for EFS movements.

Liu, Zhan. The effect of visual information feedback and subjective estimation of movement production error on the acquisition, retention, and transfer of an applied motor skill, 1993. Ph.D., University of Tennessee, Knoxville (Craig A. Wrisberg). (184pp 2f $8.00) PSY 1816
The main purpose of this study was to examine the interactive effect of immediate visual feedback about performance outcome and subjective estimation of movement production error on the acquisition, retention, and transfer of an applied motor skill. A nonpreferred-hand throwing task was the applied motor skill used in the study. An equal number of male and female subjects (n=60) were randomly assigned to one of the following groups: a) immediate visual feedback (IVFB), b) delayed visual feedback (DVFB), c) immediate visual feedback plus subjective estimation of movement production error (IVFB+SE), d) delayed visual feedback plus subjective estimation of movement production error (DVFB+SE), and e) control (CON). The experiment lasted two days and consisted of: a) an acquisition phase, b) a retention phase, c) a transfer phase, d) error-detection tests, and e) a post-experimental interview. The dependent variables were accuracy scores and variability scores for throwing performance and estimation error scores and variability scores for error-detection data. The independent variables included sex, the length of interval between completion of performance and receipt of visual feedback about performance outcome, and the subjective estimation of movement production error during this interval and during the interval between receipt of visual feedback and the beginning of the next trial. Separate MANOVAs (Wilks’ Lambda) with repeated measures on trial blocks were used to examine the effects of immediate visual feedback about performance outcome and subjective estimation of movement production error on the acquisition, retention, and transfer performance as well as on the learning of error-detection capabilities. The multivariate and univariate results revealed that the immediate visual feedback groups performed better than the delayed visual feedback groups during acquisition. However, this superiority was diminished on all retention and transfer tests. Conversely, the estimation groups outperformed the no-estimation groups during all retention and transfer trials. The results of the present study also indicated the control group displayed poorer error-detection performance than the other groups and that the error detection performance of the estimation groups was better than that of the no-estimation groups. Finally, performance accuracy of males was superior to that of females during acquisition and retention trials in the presence of KR. These findings suggest that immediate visual feedback about performance outcome enhances performance whereas subjective estimation of movement production error during the KR-delay and/or the post-KR intervals enhances skill learning. The latter effect is likely due to the development of learners’ error-detection capabilities.

Zhang, Jiabei. The effectiveness of a constant time delay procedure on teaching lifetime sport skills to adolescents with severe to profound intellectual disabilities, 1994. Ed.D., University of Georgia (Michael A. Horvat). (140pp 2f $8.00) PSY 1836

This investigation used a 4 second constant time delay (CTD) procedure to teach lifetime sport skills to adolescents with severe to profound intellectual disabilities. The CTD procedure employed verbal description plus physical assistance as the controlling prompt. The effectiveness of the CTD procedure was evaluated with a single-subject multiple probe design across three skills and replicated across four subjects. Based on acquisition and fluency data, results indicated that the CTD procedure was effective in teaching all subjects to perform one step bowling, overhand throwing, and short distance putting. These learned skills were maintained with at least 84.5% accuracy 42 days after terminating the CTD instruction. The major contributions of this investigation to the CTD literature included: (a) Gross motor lifetime sport skills could be effectively taught with the CTD procedure, (b) Verbal description plus physical assistance could be effectively employed as the controlling prompt during the CTD procedure, (c) Adolescents with severe to profound disabilities could be effectively taught using the CTD procedure, and (d) Fluency data could be effectively used to evaluate changes in gross motor skill acquisition during the CTD instruction. When efficiency data were analyzed, a mean of 16.0 sessions, a mean of 187.3 trials, and a mean of 257.8 minutes in teaching a skill to reach the instructional criterion were found across subjects while a mean percentage of errors of 8.3% was obtained across subjects and skills. These efficiency data appeared to be acceptable based on the slow learning rate demonstrated by individuals with severe to profound disabilities. INDEX WORDS: Constant Time Delay Procedure, Gross Motor Skills, Lifetime Sport Skills, Severe to Profound Intellectual Disabilities

SELF-CONCEPT


The primary purpose of this study was to examine the relationship between physical activity and physical self-efficacy in older adults. A secondary purpose was to determine the relationship between physical self-efficacy and perceived physical competence, an intermediary level of self-concept. The final purpose was to determine the association between physical self-efficacy and physical self-esteem, the highest order level of self-concept. Sonstroem and Morgan’s (1989) Exercise and Self-Esteem Model was used as the basis for the study and was subsequently evaluated for its adequacy in depicting the different relationships among the constructs of self-concept. Seventy asymptomatic older adults ranging in age from 60 to 89 comprised the sample. A between subjects survey design was used in this investigation. That is, all subjects were asked to respond to 5 questionnaires. The dependent
variables of primary interest were The Self-Efficacy Scale developed by this investigator to measure efficacy for both aerobic activity and for daily tasks, and the Physical Self-Perception Profile developed by Fox and Corbin (1989) to assess perceptions within specific subdomains of physical self-esteem. The independent variables included the Demographic Assessment developed by this investigator to determine basic subject characteristics and the Yale Physical Activity Survey designed by Dippyto, Caspersen, Ostfeld, and Nadel (1993) to assess physical activity among older adults. A series of multiple regression analyses revealed that physical activity level did contribute to the prediction of physical self-efficacy. Those who were more physically active evidenced higher self-efficacy for both aerobic and daily activity. Several other factors such as the gender and age of the subjects appeared to be related to the level of self-efficacy demonstrated. In addition, several simple correlations showed that physical self-efficacy was positively correlated with both perceived physical competence and physical self-esteem. That is, those with higher self-efficacy also had more competence and self-esteem for their physical capabilities. Results are discussed relative to prescribing and promoting exercise programs for older adults which enhance efficacy perceptions for physical activities.

Fischer, Kim E. The effects of learned time management skills on the academic and sport identities of NCAA Division III women student-volleyball athletes, 1994. Ph.D., Ohio State University (Barbara Nelson). (180pp 2f $8.00) PSY 1806

The determination of priorities and the clarification of roles and goals and objectives within roles are necessary in using one’s time and energy resources efficiently and effectively. Although proficiency in such could empower one in dealing with life’s events, concepts of time management are not always taught to collegiate student-athletes nor used consistently even though such could be beneficial in future professional and personal life and in handling the demands of the numerous roles assumed as a collegiate student-athlete. This study considers the effects of learned time management skills on the sport and academic identities and the satisfaction derived through athletic and academic participation on NCAA Division III volleyball student-athletes. A purposive, non random sampling procedure was used to select subjects from six NCAA Division III volleyball programs located in the Midwest. One institution’s team served as the treatment group and received a program of instruction in time management principles and strategies incorporating materials devised by this researcher. The other five teams served as the control group and received no planned time management instruction. Subjects completed the Sport Identity Index (SII), a survey which has been used in numerous other research efforts to tap the academic and athletic role identities and related variables once during the preseason practice period, once during the middle of the competitive season, and again following the season’s conclusion. The treatment group had a significantly higher forced choice ranking and importance rating of the academic role-identity at the postseason test administration than did the control group. In addition, the treatment group had a significantly lower sport identity as indicated by the forced choice rankings and importance ratings as well as significantly lower scores for others’ expectations for their sport involvement. Participants indicated that the sport experience resulted in increased feelings of self-esteem, inner strength, and expectations of self and said that they valued this experience because it provided the opportunity to meet new people and to make new friends. Student-athletes can manage a variety of roles but must be taught the skills to do so in order to be successful.

Handschin, Elise M. A self-talk intervention program for enhancing figure skating performance, 1995. M.S., University of North Carolina at Greensboro (Diane L. Gill). (133pp 2f $8.00) PSY 1809

The present investigation examined the influence of a self-talk intervention program on the performance and self-efficacy of four female, Novice-level figure skaters. Research indicates that high self-confidence is a common characteristic of elite athletes, and that self talk plays a role in helping athletes stay task-focused and enhances their self-efficacy. The use of self-talk as part of a performance strategy focuses on positive things about the performer and performance, and encourages the athlete to perform optimally and with self-confidence. It is argued that following a planned, confidence-building and task-focused self-talk program leaves little room for self-defeating, detrimental thoughts and in so doing, leads to an increase in performance and a better overall athletic experience. A multiple baseline design across individuals was employed for this study. On a general level, the intervention taught subjects about self-talk and how it affects their skating performance. More specifically, the intervention was designed to teach subjects to become aware of self-talk, adjust it, and finally, use it to enhance performance. Results showed an increase in both performance scores and self-efficacy scores following intervention. The descriptive results from post-intervention interviews revealed a positive influence on performance and attitude towards skating, revealed by both athlete and coach.


Forty-one Ss (mean age=58.4) were studied to determine if women with body fat of 30.5% or less differ in body image from those with body fat of over 30.5%. All subjects answered three questionnaires to determine body image data: the Body Cathexis Scale, a silhouette scale, and a
series of weight gain/loss questions. All women were measured for height, weight, waist and hip circumferences, and had skinfolds taken at the chest, axilla, triceps, subscapula, abdomen, suprailium, and thigh to determine percent body fat and waist/hip ratio (WHR). It was found that when compared to the average group, the overweight group did not have a significant (p>.05) difference in body cathexis scores. There was a significant (p<.05) difference in the silhouette scale of the two groups. Fifty seven percent of those in the average group selected the same profile for their ideal as they selected for their current silhouette; only 1 (11%) of the overweight group chose the same silhouette. Seventy percent of the overweight group and 36% of the average group stated they had a weight problem. Thus, it appears that even though women in this study did not appear to have a lowered body cathexis, 96% of the overweight group and 43% of the average group showed a dissatisfaction with their body shape and weight.

Zabriskie, Ramon B. *The effectiveness of a therapeutic recreation self-esteem program for emotionally disturbed adolescents in a residential treatment center*, 1993. M.A., Brigham Young University (S. Harold Smith). (80pp 1f $4.00) PSY 1835

The purpose of this study was to determine the effectiveness of a therapeutic recreation self-esteem program provided for emotionally disturbed adolescents while in residential treatment. Subjects of the study consisted of 112 adolescent patients at a residential treatment center. The experimental group received a therapeutic recreation self-esteem program twice per week for 8 weeks. Pre, during, and post measurements of self-esteem were recorded for both the experimental and control groups. The results using a repeated measures analysis of variance were statistically significant. Findings indicated an increase in levels of self-esteem as a result of being in residential treatment, and also indicated a much greater increase in levels of self esteem in the experimental group involved in the therapeutic recreation self-esteem program. Significant difference was also found related to ethnicity. Implications of these findings were discussed.

**SOCIAL PSYCHOLOGY**

Clark, Rebecca A. *Team perceptions of cohesion among deaf/ nondeaf culture and starter/nonstarter varsity athletes at Gallaudet University*, 1995. Ph.D., Temple University (Michael L. Sachs). (186pp 2f $8.00) PSY 1804

The purpose of this study was to investigate team cohesion among starter and nonstarter deaf collegiate athletes from Deaf and nondeaf cultures. Seventy-eight collegiate varsity athletes at Gallaudet University provided informed consent and volunteered for the study. There were eight teams: football, women’s volleyball, men’s soccer, men’s and women’s cheerleading, men’s and women’s basketball, women’s swimming, and men’s wrestling. Twenty of these subjects were randomly chosen for an interview session to collect further information on their perceptions of team cohesion. There were 49 (63%) males and 29 (37%) females. The average age was 20.7 years. Racial minorities accounted for 26% of the subjects in this study. Subjects were identified as Deaf or nondeaf culture from residential and / or mainstream secondary schools for comparison on the Group Environmental Questionnaire (GEQ) for team cohesion. An increase in the percentage of deaf students from both educational settings (residential and mainstream) are identifying themselves as bicultural without compromising their identity as deaf individuals. Starter and nonstarter status was also determined and compared with cultural and educational variables for its effect on team cohesion. Descriptive statistical tests were conducted for the Demographic and Interview Questionnaires data. An analysis of variance (ANOVA) was conducted for the experimental statistics with the GEQ data to test team cohesion hypotheses. Only two significant differences were indicated on the group integrated-social cohesion scale for nondeaf culture when compared to starter/nonstarter status for the football team. The football team starters showed more group integrated-social cohesion than nonstarters. Statistical results for the nondeaf culture teams as a whole indicated significantly greater group integrated-social scores compared to Deaf culture teams.


The purpose of this study was investigated the role of the early sport experience, family’s socioeconomic status (class), family educational level and gender upon the physical and/or sensory disabilities. During January and February of 1995, the questionnaire was translated into Chinese and copies sent to the selected elite Chinese athletes with disabilities who competed during the Third China National Games for the Disabled in February, 1992 in Guangzhou, Canton province, and those who participated in the Summer Paralympic Training Camp in Beijing Sport University in August of 1994. Of 160 questionnaires distributed, 114 were returned and 109 were used for data analysis. The majority of the respondents (97%) competed in national and international sport competitions. The ratio male and female subjects was 7:3. The mean age of the respondents was 25.4 years. Of these respondents, 49% were amputees, 14% spinal cord injured, 33% sensory impaired, and 3% with other disabilities. The family as an whole was found to be the most important agent influencing the subjects’ participation in sports and physical activities in general throughout their early years. Chinese female elite athletes with disabilities were found more
likely to participate in competitive and non-competitive sports during adolescence compared to their male counterparts. This finding suggested that female elite athletes with disabilities in China might have better chances to access sports and physical activity than male athletes with disabilities. Family's socioeconomic status and parental educational level took on important roles influencing on the participation in sport of these elite Chinese athletes with disabilities.


This study is a sociological analysis of the retirement and adjustment processes of top level athletes. The retirement period was examined and later explained in light of: a) Significant causal attribution factors which were found to influence athletes’ decision to retire. b) The relationship between the reasons for retirement and specific determined variables of the adjustment process: feelings, thoughts, relationships, leisure activities, socio-economic status, and health state. The adjustment process was analyzed from two aspects: a) On the attitudinal level the significant variables were found which are linked to general life satisfaction. b) On the behavioral level the level of involvement or activity in specific roles and demographic characteristics were compared pre and post retirement. The list of role characteristics which were determined as criteria for adjustment and were subject to change as a result of withdrawal from top sport include family, leisure, education, and occupational role. The study examined 296 Olympic and non-Olympic top level athletes who retired from top sport between 1952 and 1989. The purpose of the data processing was to explain the attitudes and behavior of the top athletes in the retirement period and transition process from athlete’s role to ex-athlete’s role. As there is no specific theoretical framework relating to sport retirement setting (Cumming & Henry, 1961; Atchley, 1976; Havighurst, 1969). While most sociologists, gerontologists and sport sociologists found that retirement in general and from sport in particular caused adjustment problems (Blau, 1973; Rosow, 1974; Mihovilovic, 1968; McPherson, 1980; Ogilvie & Howe, 1981), others found that retirement regardless of the profession does not have to be traumatic and sometimes may even give the retiree the option of choosing an alternative career for the enrichment of personality (Kremer, 1978; Coakley, 1983; Greendorfer & Blinde, 1985).

In the literature, the main factors which were found to influence most the level of adjustment were: S.E.S. level, health state, education level, and the degree of activity, continuity (or disengagement) of the retiree life style. The results of the retirement period examination reveal: 1) 5 factors for retirement. These are “Burnout”, “Relations”, “Family”, “Health” and “Future State”. 2) A low linkage was found between various reasons for retirement and specific adjustment variables. 3) Low positive linkage was found between general life satisfaction and reason burnout, searching for a new job and difficulty level of retirement. The findings indicate that the reasons for retirement are linked to a small extent to different adjustment variables.

Wallington, Mark C. *Portrayal changes of the American athlete in popular film*, 1993. M.S., University of Florida (Ruth Alexander). (120pp 2f $8.00) PSY 1834

This thesis was an effort to reveal and explain the stereotypical portrayals of athletes in film and the change from predominantly positive portrayals to negative ones during the era of the Vietnam War. Athletes, both professional and amateur, were largely revered in movies until a period of immense social change commonly resulted in pessimistic portrayals of players, sports leagues, and athletic programs in general. This study includes a qualitative content analysis of popular films featuring major portrayals of athletes. A random sample of 20 sports films made before 1970 was selected by availability and compared to a random sample of 20 sports films made in 1970 or later, selected by financial success. The year, 1970, was used as a divider because it was the middle of the Vietnam War era in the United States, the time the author considered most important regarding changes in sport film. The 40 films were categorized as presenting positive, negative, or neutral portrayals of athletes. The author hypothesized that portrayals before 1970 would be significantly more positive than portrayals from 1970 or later. The analysis showed a substantial change in portrayals in the two eras of film, with a majority of the later movies portraying athletes through a negative stereotype. This thesis also includes a history of sport film, a description of the treatment of women in sport film and a review of athlete portrayals on television. The conclusion revealed that a majority of the most successful sports films made in 1970 or later exhibited a severe reversal in the treatment of athletes and athletics from positive to negative. This change was largely in response to a generation that questioned authority and rejected traditional heroes such as athletes. Other causes included a new adversarial role of the media and a new permissiveness by film in presenting violence, sex and profanity. This variation in film portrayals may affect the views and attitudes of the consumer and change how the public perceives athletes and sport.

**STRESS**

Green, Leah L. *Effects of a theraband exercise program and psychological skills training on mood, stress, cognitive processing, and muscular strength of African-American elderly*, 1995. M.Ed., Temple University (Carole A. Oglesby). (100pp 2f $8.00) PSY 1808
The purpose of this study was to examine the effects of a theraband exercise program and psychological skills training on mood, stress, cognitive processing and muscular strength of African-American elderly. Twenty-eight African-American elderly, including 4 males and 24 females participated in a theraband exercise program and psychological skills training at a North Philadelphia church and residential unit. The exercise program was of low intensity for 60 minutes twice weekly for 6 weeks with a unique approach of using elastic theraband to provide resistance to develop muscular strength. The exercise program was performed to music. The treatment consisted of 5 minutes of warm-up, 20 minutes of aerobic exercise, 5 minutes of cool-down, 15 minutes of stress management (deep breathing), 15 minutes of therabanding for each session. Each exercise program was enhanced by the Green Psychological Skills Training Program—Geriatric. The Green Psychological Skills Training Program—Geriatric included motivation, goal setting, and stress management technique (deep breathing). The psychological skills were provided to the subjects before, during, and after the exercise program. Measurement of mood, stress, cognitive processing, and muscular strength involved the administration of the Profile of Mood States Bipolar form (POMS-BI), Subjective Units of Disturbance (SUDS), Digit Span subtest of the Wechsler Adult Intelligence Scale (WAIS), and the hand dynamometer for both pre- and post-tests. Two statistical techniques, Wilcoxon Matched Pairs Signed-Rank Test and analysis of variance (ANOVA) with Repeated measures was used to analyze the data. The results revealed the following: Hypothesis 1.1 stated no statistically significant differences would be found between SUDS pre- and post-tests. The Wilcoxon test and ANOVA with Repeated measures indicated no statistically significant difference. Thus, the null hypothesis could not be rejected. Hypothesis 1.2 stated no statistically significant difference would be found between POMS-BI pre- and post-tests. When examining mood states, the Wilcoxon test indicated that the null hypothesis could be rejected at the .05 probability level on three bipolar scales of composed-anxious, and confident-unsure, and rejected at the .01 probability level on clearheaded-confused. ANOVA with Repeated measures indicated the null hypothesis could be rejected on the confident-unsure and clearheaded-confused bipolar scales at the .05 level. Hypothesis 1.3 stated no statistically significant difference would be found between cognitive processing pre and post-tests. Pre- and post-tests indicated no statistically significant difference. Thus, the null hypothesis could not be rejected. Hypothesis 1.4 stated no statistically significant difference would be found between muscular strength pre- and post-tests. When examining muscular strength, the Wilcoxon test indicated the null hypothesis could be rejected at the .01 probability level. ANOVA with Repeated measures indicated a significant difference at the .05 level.
This index includes keywords for titles published in microfiche format by Microform Publications in Supplement Volume 8, No. 2 (October 1995).

Each title in Part I is indexed using keywords selected and assigned from the Sport Thesaurus, published by the Sport Information Resource Centre (SIRC), located in Gloucester, Canada. (Users should note that British spelling conventions [e.g., behaviour] occasionally appear.) In addition to keywords identifying the content of a study, the major research methods are identified by the statistical technique employed and appear in brackets immediately following the keywords list for each title. Users may find these methodological and statistical descriptors helpful in identifying a particular design or statistical prototype for their own research investigations. A listing of statistical abbreviations used in this index is found on the following page.

The first keyword for each title was used to generate the primary topical categories for the index; they appear in bold typeface. Titles having the same first keywords (primary topical category) are grouped under that category. The remaining keywords for each separate title are indented and listed, from general to specific, followed by the research and statistical methods used in the study contained in brackets (note that letters before the dash refer to the research methods, those after the dash denote the statistical methods), the author’s last name and initials, and the identification number for the title. The following example illustrates the elements of each entry.

BIOMECHANICS

ANKLE JOINT, RANGE OF MOTION, BRACE, STEP TRAINING, INJURY, SPRAIN, SEGMENTAL ANALYSIS TECHNIQUE, VARIANCE; [D,MA-DE,MR]. Money, S.M., PE 3439

Biomechanics is the primary topic of this study; keywords ankle joint through variance further delimit it. The research methods include descriptive and mechanical analysis techniques; statistics are descriptive and multiple regression. The author is S.M. Money and the study’s identification number is PE 3439. To find the title of the study as listed in part I of the Supplement, use the author index at the end of the Supplement to find the page number on which the study by S.M. Money is listed.

Criteria used to determine whether a study is experimental include the use of a control group and the manipulation of an independent variable or variables. Studies designed to examine correlations among selected variables in a particular population are classified as surveys.

Specific abbreviations for research methods and the statistical techniques that were used are listed alphabetically as follows:
METHODS

A  Anthropometry     E  Experimental
AR  Action Research  GE  Genetic
C   Case Study       H  Historical
CA  Content Analysis I   Interview
CH  Choreography     IA  Item Analysis
CI  Critical Incident Analysis J  Jury
COM Comparative Study JA  Job Analysis
D   Descriptive      L  Laboratory
DA  Documentary Analysis LR  Library Research

STATISTICS

AC  Analysis of Covariance MAC  Multivariate Analysis of Covariance
AV  Analysis of Variance MAV  Multivariate Analysis of Variance
AV(F) Analysis of Variance (Friedman) MDA  Multivariate Discriminant Analysis
B   Binomial         %  Percent
BC  Biserial Correlation PR  Phi Coefficient
BON Bonferroni Method MR  Multiple Regression
CAN Canonical Correlation N  Normative
CC  Contingency Coefficient NK  Newman-Keuls
CO  Cohen's Coefficient of Agreement PA  Path Analysis
CQ  Cochran Q Test    PC  Phi Coefficient
CS  Chi Square        %  Percent
CV  Coefficient of Variation PR  Phi Coefficient
DE  Descriptive       RC  Reliability Coefficient
DEL Delphi Method      RE  Regression Equation
DisA Discriminant Analysis RM  Repeated Measures
DU  Duncan Multiple Regression RPM  Pearson Product-Moment
DUN Dunn Test          SB  Spearman-Brown Prophecy
Eta Curvilinear Correlation SCH Scheffe's Method
F   Flanagan Procedure SEE Standard Error of the
FA  Factor Analysis    SI  Sign Test
G   Graphic           SP  Split Plot Repeated Measures
GA  Gamma Method of Association T  T Ratio
GG  Greenhouse Geisser Conservative Test TR  Tetrachoric Correlation
HA  Hartley's Method   SR  Signed Ranks
HS  Hull's Method      SSP  Split-Split Plot Repeated Measures Analysis
HV  Homogeneity of Variance TAU  Kendall's Rank Coefficient
K   Kirk's Test        T  T Ratio
KC  Coefficient of Consistence TA  Trend Analysis
KR  Kuder-Richardson  TR  Tetrachoric Correlation
KS  Kolmogorov-Smirnov TU  Tukey's Test
KW  Kruskal-Wallis     U  Mann-Whitney U Test
LR  Logistic Regression V  Votaw Formula
LSD Least Significant Variance
KEYWORDS

ACADEMIC ACHIEVEMENT

ATHLETE, NON-ATHLETE, NATIONAL ASSOCIATION OF INTERCOLLEGIATE ATHLETICS, SEX FACTOR, COMPARATIVE STUDY; [D,DA-DE,AC]. Akker, K.V., PSY 1797

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#### Books

- **Biomechanics.** Proceedings of the 1984 Olympic Scientific Congress, 1986, 352 pages. $15.00
- **Physical Education, Sports and the Sciences.** H. Harrison Clarke Symposium Papers, 1976. 406 pages. $10.00
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