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This publication is the second issue of Bulletin 13. The bulletin represents microfiche published in October 2000. In the past, bulletins were published every 5 years, except for Bulletin 7, which covers two and a half years. Beginning with Bulletin 8, there are two issues (nos 1 and 2) per annual bulletin. Each issue includes a section of theses and dissertation titles and abstracts, as well as a section of keywords. Bulletin 14, 1 will be published in April 2001.

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PART I: TITLES AND ABSTRACTS

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PHYSICAL EDUCATION AND ATHLETICS

ADMINISTRATION

Baumgartner, Amy. Factors that influence Division II recruited female intercollegiate soccer student-athletes in selecting their university of choice, 1999. M.S., Slippery Rock University (Catriona Higgs). (70pp 1f $5.00) PE 4095

A paucity of research exists that explores the reasons why female student-athletes choose an academic institution. The purpose of this study was to determine the factors that influence Division II recruited female intercollegiate soccer student-athletes in selecting their university of choice. The subjects were 366 female soccer players participating in the Pennsylvania State Athletic Conference (PSAC) in the 1997-1998 season. A pilot study was conducted with 23 female student-athletes to assist with the validation and modification of the instrument. Data were collected by the researcher through a questionnaire instrument consisting of 32 Likert scale and short answer questions. A descriptive analysis revealed that an institution’s academic reputation was the most important factor identified by the subjects in deciding which institution to attend. The least important factor chosen by the student-athletes was community support. The present study differed considerably from previous research conducted in this area.


Offensive softball (SB) statistics were examined for 69 Michigan (MI) and 120 Iowa (IA) teams that had qualified for their respective state SB tournaments, to determine the effect of playing seasons on their performance. State qualifying team statistics were organized into groups according to state, year, and class size. It was concluded that IA teams offered significantly (p<.05) more offensive opportunities. IA teams averaged significantly (p<.05) more games, at bats, hits, and doubles than the MI teams; however, the MI teams did significantly better (p<.05) in the areas of batting averages, triples, and home runs. It was determined that, due to the lack of previous studies, further investigations on defensive statistics are needed to establish the relevance of playing seasons for SB in the Midwest.


Sexual harassment and mistreatment of students in medical school and allied health programs have been well documented. A student athletic trainer perceptions-of-treatment questionnaire was used to determine the perceptions of Ss in athletic training education programs (ATEP). The sample included 260 Ss (93 male and 167 female; age 21.8±3.24 years, 19-44) enrolled in ATEP (2.37 years±.996 years; accumulated hours 880.75±451.11, 56-2500 hours). Return rate was 47.6% from Ss surveyed in accredited ATEPs. Ss were asked about self and peer perceived discrimination. Results indicated that 60.4%(male=66.7%, female=56.9%) of the Ss felt they were victims of discrimination. Areas in which Ss perceived discrimination directed toward themselves included: offensive language (44.2%), exclusion on the basis of gender (31.2%), sexual humor (25%), and unwanted sexual advances (3.8%). 63.8% (male=72%, female=60.5%) of the Ss thought their peers were victims of discrimination. Areas in which Ss perceived discrimination of peers included: offensive language (56.9%), exclusion on the basis of gender (31.5%), sexual humor (35.4%), and unwanted sexual advances (11.5%). Offenders of such perceived behaviors are as follows:

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<th>Position</th>
<th>Program Directors</th>
<th>Head AT</th>
<th>Asst. AT</th>
<th>Graduate Asst. AT</th>
<th>Others</th>
<th>Total</th>
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<td>Male</td>
<td>17</td>
<td>62</td>
<td>31</td>
<td>23</td>
<td>11</td>
<td>144</td>
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<td>Females</td>
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<td>12</td>
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<td>74</td>
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<td>56</td>
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<td>20</td>
<td>69</td>
<td>75</td>
<td>28</td>
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<td>205</td>
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</table>
Because of the high rate of perceived discrimination, there appears to be a need for clinical instructors and student athletic trainers to communicate their feelings to curb possible detrimental effects on clinical experiences.


The purpose of this study is to analyze the Exit Survey Data of student-athletes at the University of North Carolina from 1994 to 1999. The survey is administered each Spring Semester to senior student-athletes. The Academic Support Program administered the survey to a total of 448 student-athletes from 1994 to 1999. The survey addressed perceptions of student-athletes regarding the following topics: coaches’ academic expectations, effects of athletic participation on academic achievement, faculty relations, and the Academic Support Program’s staff, programs, and services. Student-athletes at the University of North Carolina, particularly males and athletes competing on revenue teams, felt that athletic participation had negatively affected their academic achievement. Despite this, student-athletes reported favorably about their experiences with faculty, coaches, and staff, as well as about the programs and services offered by the Academic Support Program.

Stepp, Thomas. *An analysis of NCAA Division I-A football sports information directors’ experiences with independent Internet sites*, 2000. M.A., University of North Carolina, Chapel Hill (Barbara Bickford). (48pp 1f $5.00) PE 4155

The purpose of this study is to examine the experiences of NCAA Division I-A football sports information directors with independent Internet sites. The study focused primarily on whether or not independent Internet sites have made requests for credentials, and/or to gain access to players and coaches for interviews, and, if so, whether or not the requests were granted, and why. A total of 45 sports information directors responded to the questionnaire. Responses to the questionnaires were analyzed by using frequencies for the yes or no questions. The open-ended questions, which required text responses, were reviewed for similarities by the project coordinator. Responses to each question were compared from survey to survey. The results of the study show that a majority of sports information directors are receiving requests for credentials and player/coach interviews from independent Internet sites. Also, a majority of these requests are being denied, primarily because of a lack of journalistic standards by the sites, for which, in the view of sports information directors, they are not being held accountable.

**COACHING AND TRAINING**

Anderson, Laura J. *Impact of training patterns on incidence of illness and injury during a women’s basketball season*, 2000. M.S., University of Wisconsin, La Crosse (Travis Triplett-McBride). (41pp 1f $5.00) PE 4134

This study was conducted to monitor training patterns throughout a basketball season, in order to determine if a relationship exists between the physical stress of practice and the occurrence of injuries and illnesses in NCAA Division III athletes. Se consisted of college women (N=12), ranging in age from 18-22 yrs. A Certified Athletic Trainer distributed a questionnaire following each practice, including 2 weeks of preseason, documenting the presence of injury and/or illness related to the intensity and duration of practice. Training load, training monotony, and training strain were computed using the session RPE method. An increase in injury occurred during times of increased training loads, particularly during the first 2 weeks of formal practice, and immediately subsequent to the holidays. The temporal relationship between training load and injury suggests a causative link (p<0.01; r=0.675). The present data suggest that the periodization pattern of basketball training may be linked to the likelihood of illness/injury.

Freeland, Elizabeth M. *Perceptions of collegiate coaches on coach education and certification in the United States*, 2000. M.A., University of North Carolina, Chapel Hill (Diane Stevens). (111pp 2f $10.00) PE 4151

Coach education is becoming an increasingly important topic in sport worldwide. Several countries, such as Canada, Australia, Germany and Great Britain have established accreditation and certification programs in an attempt to ensure quality coaching at all levels of sport. The United States has taken little initiative to create a unified, comprehensive coach education curriculum for current and aspiring coaches. Research in the area of coach education is lacking considerably, with most of it focusing on youth levels. The present study was designed to generate information about coach education at the collegiate level, specifically examining the educational background of coaches and their perceptions toward coach education and certification. Results indicated coaches generally had positive perceptions toward coach education, with particular stress on the importance of practical experiences in preparing future coaches. Although coaches had engaged in various forms of coach education (e.g., seminars, clinics, etc.), many had differing opinions concerning whether coach education would be beneficial to intercollegiate sport. Chi Square analyses resulted in no significant differences for hypothesized comparisons of sub-samples. Recommendations are made for future research and for the development of coach education.
Goodwin, Ernest C. *An evaluation of the square and staggered stance utilized in amateur wrestling*, 2000. M.S., Springfield College (William Considine). (80pp 1f $5.00) PE 4159

The investigation was designed to determine whether an association existed between the offensive-defensive stance combinations (staggered-staggered, staggered-square, square-staggered, and square-square) and the type of takedown (offensive, defensive, and no) and any differences in frequencies for each of the offensive-defensive stance combinations and type of takedown. Video tapes of the 1997 Middle Atlantic Wrestling Association New England District Tournament matches (N=150) were used for analysis. The independent variables in the investigation consisted of the offensive-defensive stance combinations and the type of takedown. The dependent variable was the frequency of attempted takedowns (N=430). A two-way chi-square analysis was used to determine an association between offensive defensive stance combinations and type of takedown. No association (p>.05) was found. One-way chi-square analyses were used to compare observed with expected frequencies for offensive-defensive stance and type of takedown. A significant (p<.05) difference for both the offensive-defensive stance and type of takedown was found.

Iagulli, Jonathan J. *The importance of team chemistry to the success of the top 25 Division III football programs of the 1990s*, 2000. M.S., Ball State University (Marilyn Buck). (50pp 1f $5.00) PE 4112

The purpose of this study was two fold. The first aspect was to evaluate how important positive team chemistry was to the top 25 National Collegiate Athletic Association (NCAA) Division III (D III) football programs of the 1990s. The second aspect was to investigate, by means of a survey, what the head coaches did to create that chemistry. Two research questions were developed to answer both purposes of the study. The subjects of this study were the head coaches from the top 25 NCAA D III football programs of the 1990s. The football coaches were selected by the winning percentage of their respective football programs. Each coach was sent a questionnaire to complete. Twenty of the twenty-five questionnaires were returned. Following the compiling of the data it was concluded by the researcher that team chemistry was considered a valuable aspect in the success of the top D III football programs of the 1990s. The coaches provided many examples of chemistry building. Some of those examples include team meetings, cookouts, movie nights and team service projects. The significance of this study may reach many areas. The study is significant for football coaches to understand that a team’s chemistry could be the difference between a successful season and an unsuccessful one. Since team chemistry has played a significant role in the success of the top 25 NCAA D III football programs of the 1990s, then many other coaches at different levels of football may want to see if chemistry is what they need for their programs to be successful as well. Also, others may research the effects of team chemistry on the success of other team sports.

Lindauer, Jeffrey R. *A comparison of preferred coaching leadership behaviors of college athletes in individual and team sports*, 2000. M.S., University of Wisconsin-La Crosse (Jeffrey Steffen). (55pp 1f $5.00) PE 4138

Preferences for specific coaching behaviors of male and female athletes in individual and team sports were measured by the Modification and Revision of the Leadership Scale for Sport. Ss (N=167) were selected from individual (wrestling and men’s and women’s track and field) and team (men’s basketball, baseball, and softball) sports at the University of Wisconsin-La Crosse. There were differences between individual and team sport athletes and between male and female athletes’ preferences for specific coaching behaviors (p<.05). Differences were found in Democratic Behavior (DB), Autocratic Behavior (AB), Positive Feedback (PF), and Social Support (SS) (p<.05). No differences were found in Situational Considerations (SC) or Training and Instruction (TI). There were differences between sports teams’ preferences for specific coaching behaviors (p<.05). Post hoc comparisons of the 6 subscales tested showed there were significant differences between the preferences of specific sports teams in DB, AB, PF, SC, and SS (p<.05). No differences were found in TI. It is recommended that coaches align their coaching style to meet the needs of their team. Coaches should consider dependence and gender as factors that influence satisfaction and performance of their athletes.

Robbins, Jamie E. *Athletes’ perceptions of social support provided by their head coach, assistant coach, and athletic trainer, pre-injury and during rehabilitation*, 2000. M.A., University of North Carolina, Chapel Hill (Bill Prentice). (108pp 2f $10.00) PE 4110

The study evaluates athletes’ perceptions of social support—who provides each of the six types of support, how satisfied they are with the amount and type of support they receive, and the effect of support on their well-being—provided by their head coaches, assistant coaches, and athletic trainers pre-injury and during rehabilitation. Thirty-five male and female Division I level collegiate athletes from various sports were assessed after completing a modified version of the Social Support Survey; seven athletes participated in a follow-up interview. Data were analyzed using analysis of variance tests, dependent t-tests, and content analysis. Results revealed a significant difference (p<.01) between the athletes’ satisfaction with the three possible providers and their impact on the athletes’ overall well-being during rehabilitation. Athletic trainers were perceived to provide more support than the head and assistant coaches. Findings demonstrate the
positive benefit athletic trainers provide to the injured athletes’ recovery effort and the possible positive impact additional coaching support may provide in the future.

Stewart, Laura K. A cross sectional examination of the training habits and lifestyle characteristics of triathletes, 2000. M.S., Purdue University (Roseann M. Lyle). (81pp 1f $5.00) PE 4148

This study describes the training habits and lifestyle characteristics of triathletes in the Eastern and Midwestern regions of the United States. A survey including training practices, dietary intake, supplement use, injury rate, health status, and demographic data was completed by 514 triathletes (367 males and 147 females) in sprint (3.3%), Olympic (57.2%), and half ironman distance (39.5%) triathlons. Age ranged from 18-68 years with male participants being older (34.0±9.5; 31.2±7.1, p=0.01). In-season training averaged 3.5 hours/week swimming, 6.6 hours/week cycling, 4.7 hours/week running with 94% of athletes taking 1-2 days rest/week vs. 2.2 hours/week swimming, 3.4 hours/week cycling, 3.7 hours running with 55% of athletes taking 24 days rest/week in the off season. While 31.9% of surveyed athletes practiced some form of vegetarianism, 94.3% did not count calories. Overall servings of grains (4.3), fruits (3.0), and vegetables (3.0) were low compared to the food guide pyramid recommendations. Supplements used included liquids (92.3%), bars (90.4%), and vitamins and minerals (78.2%). Knee (46.1%), foot (32.2%), and back (28.1%) injuries were the most common. Significant gender differences were noted among physical characteristics (p=0.01), experience (p=0.01), performance (p=0.001), nutrition (p=0.003) and supplementation categories (p=0.01). On the other hand, no gender differences existed with respect to the number, site and severity of injuries, self-reported health status or quality of life. The number of hours spent training per week was associated with performance, experience level, dietary pattern, supplement use, injury experience, health status and source of training information. This study adds to the currently limited body of research on the sport of triathlon by providing information on the similarities and differences in training and lifestyle practices of men and women at varying levels of triathlon involvement. Results of this study may stimulate new ideas for improving the sport of triathlon while providing an efficient and productive sport environment for triathletes.

Tsutsumi, Tomoko. Players’ and coaches’ perceptions about leadership styles of successful women’s basketball coaches, 2000. M.A., Ball State University (Valerie Wayda). (62pp 1f $5.00) PE 4113

The purpose of this study was to investigate players’ perceptions and their respective coaches’ perceptions about the leadership styles of successful women’s basketball coaches at the collegiate level. After the enactment of Title IX the number of girls and women participating in sport increased; however, the number of female coaches dramatically declined. One line of research has focused on the topic of leadership effectiveness and leadership styles as a possible reason for this decline. The 32 teams who advanced to the Women’s 2000 NCAA Basketball Tournament were re-confirmed with the results of the tournament, which were selected as the sample. Each head coach (n=32) and five of his/her athletes (n=160) were asked to complete a demographic form and the Leadership Scale for Sport. After completing the questionnaire, each player and coach put the survey in a sealed envelope and returned it via mail to investigator. The findings of this study showed that successful women’s basketball head coaches utilized training and instruction and positive feedback most, and the players perceived their head coaches employed training and instruction and positive feedback. The majority of the players preferred positive feedback and training and instruction. There was a significant correlation between players’ perceived and players’ preferred leadership styles, while there was no significant correlation between the coaches’ utilized and players’ perceived, or the coaches’ utilized and players’ preferred leadership styles.

GROWTH AND DEVELOPMENT

Kissinger, Kipp R. Relationship between reported childhood and adult physical activity, 2000. M.S., University of Nebraska, Omaha (Kris Berg). (75pp 1f $5.00) PE 4101

It was the purpose of this research to examine the relationship between reported childhood and adult physical activity (PA), with special regard to the types of activities that correlate with habitual activity. Subjects were 249 male and female students age 19 to 30 years (M=21.9 years) enrolled at the University of Nebraska at Omaha. Subjects were surveyed from all departments on campus. Subjects were asked to complete a survey instrument that assessed past and present PA. The results of the current study reported that there is a significant positive correlation (r=0.284, p≤0.05) between the total score of past childhood PA and present adult PA. When past PA was divided into pre-teen and adolescent periods, there were also significant relationships (p≤0.05) with all four indices of present PA (work sport, leisure and total). Regression analysis explained 17.6% of the variance in exercise when predicting adult PA from the total score of past PA. The prediction equation is as follows: Y=27.761+0.775 (X1)+0.276 (X2)+0.945 (X3)+1.787 (X4)-1.254 (X5); where X1=number of varsity athletic letters received as an adolescent, X2=informal activities as a pre-teen, X3=level of athletic ability or coordination in favorite sport as an adolescent, X4=P.E. classes as an adolescent, and X5=activity level compared to peers as a pre-teen. It was concluded that
there was a significant positive correlation (p≤0.05) between the total score of past PA and each of the four indices of present PA.

Polzien, Kristen M. The effects of pubertal status on energy expenditure during cycling, 2000. M.A., University of North Carolina, Chapel Hill (Robert McMurray). (58pp 1f $5.00) PE 4152

To evaluate pubertal status differences in energy expenditure during outdoor simulated cycling, oxygen uptake for 40 females and 43 males (aged 8-18 years) was measured at a speed of 8mph (12.8 kpm) using a portable metabolic unit. Puberty stage was determined by questionnaire. Pubertal status, age and gender were analyzed together; results indicated that pubertal status was a significant contributor (r²=0.45; p<0.0001) to variation in exercise energy expenditure, whereas age (p=0.38) and gender (p=0.21) were not. Energy expenditure decreased with advancing pubertal status (P1=34.15, PII=32.33, PIII=26.65, PIV=23.45, PV=20.77). Analysis of net energy expenditure (exercise energy expenditure minus resting energy expenditure) produced similar results (pubertal status, p<0.0001), indicating that resting energy expenditure did not account for all of the variation in exercise energy expenditure. These results indicate that the physiological changes associated with adolescent development, marked by puberty stage, may be more important contributors to energy expenditure than simply advancing chronological age.

**HISTORY AND PHILOSOPHY**

Aldousari, Badi. The history and the philosophy of sport in Islam, 2000. M.A., Ball State University (Marilyn Buck). (79pp 1f $5.00) PE 4160

This paper investigates the history and philosophy of sports in Islam, including women's sports. Based on available research, Holy Qur'anic Scriptures, prophetic heritage, Islamic jurisprudence, history, and current related literature, the paper extracts the philosophy and history of sports in Islam and the status of women's sports in Islam and Muslim communities, as well as the current status of sports in Muslim communities in modern times. For this purpose, the study utilizes all available resources in both the Arabic and English languages. Online resources provided reports on current events that bear on the topic. The procedure adopted herein is a historical and philosophical analysis. Overall, the paper concludes that Islam is pro-sports, with some reservations (conditions) to women's gear and appearance when participating in sports. Such conditions mostly determine whether women's sports should be intersexual or intrasexual. Put differently, women's sports are required to be intrasexual, which restricts them to (1) the confines of family and/or relatives and (2) female spectatorship and participation. This precludes intersexual sports, meaning that segregation of the sexes in sports is religiously enforced. Sports like soccer, volleyball, basketball and the like seldom have intersexual (of both genders) teams; they are either completely female or completely male. This is the state of affairs worldwide, even in the United States. However, as far as non-team sports are concerned, the popular attitude is different today; there are no restrictions at all, as attested by the participation of Muslim communities and individuals in world sporting events. The current status in Muslim communities is definitely pro-sport, which is witnessed worldwide.

Hancock, Elizabeth A. Frances B. Hogan—professional educator, coach and director of intercollegiate athletics for women at the University of North Carolina at Chapel Hill: contributions to the Department of Physical Education and development of women's athletics, 2000. M.A., University of North Carolina, Chapel Hill (Ronald Hyatt). (97pp 1f $5.00) PE 4105

The purpose of this study is to record the contributions of Frances B. Hogan as professor, coach, and Director of Intercollegiate Athletics for Women in the Department of Physical Education and in women’s athletics at the University of North Carolina at Chapel Hill. The main focus is on Hogan as a pioneer in advancing women’s athletics at the University of North Carolina and in the state. She was a driving force in increasing equal opportunities for women. Title IX came into effect during her tenure, bringing about enormous changes in women’s athletics, and Hogan’s outstanding leadership fostered new attitudes regarding women’s athletics and the ability of women to play sports.

Hendrick, Kevin. The history of the North Carolina Governor’s Council on Physical Fitness and Health, 2000. M.A., University of North Carolina, Chapel Hill (Ronald Hyatt). (83pp 1f $5.00) PE 4104

The purpose of this thesis is to provide the first written history of the North Carolina Governor’s Council on Physical Fitness and Health. The Governor’s Council is a state-created agency with a mission to improve the physical fitness of all North Carolinians. It is comprised of a ten-member governing board and is operated on a day-to-day basis by an executive director. A series of personal interviews and a compilation of literature were used to complete the study. The thesis reviews the contributions of the Youth Fitness Commission and details the Governor’s Council history from its creation in the North Carolina legislature in 1979 through its current work in the comprehensive Be Active North Carolina fitness initiative. A thorough examination of Governor’s Council accomplishments, a complete list of Governor’s council members and commendations and recommendations to the Governor’s Council were an outcome of this thesis.
MEASUREMENT AND EVALUATION


Considerable research has been conducted clinically to establish protocols for assessing postural stability utilizing a multitude of balance index system modalities. The purpose of this study was to investigate the use of more practical and less expensive balance equipment to predict composite equilibrium scores from a modified Sensory Organization Test (SOT). Sixty-three healthy subjects were tested for single leg stance balance performance utilizing the Balance Error Scoring System (BESS) on four surfaces (firm, foam, rocker-board, and Teton Tremor), the Biodex Stability System, and the Cybex FASTEX. Multiple and simple regression analyses revealed that only the Teton Tremor surface condition, within the BESS protocol, explained a significant amount of the variance (8%) in predicted modified SOT composite equilibrium scores. Pearson correlation analyses revealed significant relationships between the Biodex and FASTEX, BESS foam and rocker-board surface conditions, BESS rocker-board surface condition and FASTEX, as well as the BESS Teton Tremor surface condition and modified SOT composite equilibrium scores. The results of this study indicate that while the Teton Tremor was found to be the best predictor of overall balance performance, as measured by a modified SOT composite equilibrium score, it does not appear to have strong statistical relevance or clinical application. Clinicians should consider using a battery of evaluative tests when assessing postural stability and establishing baseline data to aid in the interpretation of post-injury evaluative measures.


The purpose of this study was to investigate the predictive power of different methods of measuring body composition in African American and Caucasian females. Subjects included 20 African Americans and 25 Caucasians aged 18-27. All subjects completed testing of bioelectrical impedance analysis (BIA), skinfold near-infrared (NIR), and hydrostatic weighing. The data was analyzed using a 2 (race) x 4 (body composition method) ANOVA with repeated measures. There was a significant difference in methods across race (F=2.31; p<0.136). Post hoc analysis revealed that BIA was significantly different from hydrostatic weighing for both African Americans and Caucasians. The results indicated a tendency to overestimate percent body fat for African Americans and Caucasians using BIA, skinfold and NIR methods.


A link between age-related changes in body composition (BC) and the increased prevalence of disease and disability in old age has been well established (Chumlea & Baumgartner, 1989; Going et al., 1995; Shephard, 1997). Consequently, BC assessment is becoming increasingly important in the evaluation of the health and functional status of the older adult. Individuals 75 years and older comprise one of the fastest growing segments of the population in North America (Canada, 1999; Donatelle & Davis, 1994), yet current BC measurement techniques may not be accurate or reliable in this older age group. The intent of this research was to develop new body fat prediction equations in elderly women based on anthropometry and the criterion method of dual energy X-ray absorptiometry (DEXA), which is considered to be more valid than conventional densitometry among the aging population (Baumgartner et al., 1995; Kohrt, 1998; Visser et al., 1998). Anthropometry, skinfold (SF) anthropometry, and DEXA (Hologic QDR-4500W) body fat data were initially collected in a sample of 43 women 75-80 years old (m=77.4years) as part of a larger study investigating the effects of strength training on strength, function, bone mineral density (BMD), and BC. Eight BC prediction equations for the elderly were selected from the literature and applied to these data. The correlation between prediction equations and DEXA ranged from 0.76-0.97. However, paired t-tests difference scores (δ) showed that all but one of the equations overestimated DEXA body fat in these older aged women (delta ranged from -3.3kg to 4.0kg and 4.4% to 9.0%; p<0.001 in all cases). New equations were derived for FM, %Fat, trunk fat mass (TFM) and percent trunk fat (%TF) using a combination of stepwise and all possible subsets regression procedures, as both total and regional percent fat are important health indicators (Going et al., 1995). The following were entered as predictor variables: weight (WT), height (HT), BMI, hip circumference (HOC), waist circumference (WC), SFs of the subscapular (SS), suprailiac (SI), abdominal (ABD), and midaxillary (MA) sites, the SS to triceps skinfold ratio (STTRI), and the sum of triceps, biceps, SI and SS (SUM4SF); except HC and SUM4SF were not included in the trunk fat regressions.

<table>
<thead>
<tr>
<th>New equation</th>
<th>Adj.R²</th>
<th>Cp</th>
<th>SEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM =-0.611(WT) -2.31(HT) +.143(MA) -16.462</td>
<td>0.95</td>
<td>4.46</td>
<td>1.53kg</td>
</tr>
<tr>
<td>%Fat =-0.341(WT) -3.39(HT) +.258(MA) +60.122</td>
<td>0.84</td>
<td>4.61</td>
<td>2.12%</td>
</tr>
<tr>
<td>TFM =-0.185(WT) -0.088(HT) -0.112(MA) +60.122</td>
<td>0.90</td>
<td>3.77</td>
<td>1.27kg</td>
</tr>
<tr>
<td>%FT =-0.387(MA) -2.27(HT) -.35G(WC) -30.659</td>
<td>0.83</td>
<td>3.9</td>
<td>2.76%</td>
</tr>
</tbody>
</table>
Ultimately, the measure of interest in body composition assessment is the value %Fat and thus supports using the %Fat equation over that for FM. Moreover, %Fat equation was associated with less error (C.V. %Fat = 5.9%; C.V. %FM = 6.4%). The %TF equation, however, was less precise than the equation for total %Fat and therefore was not considered further in this research. Subsequent analysis showed the %Fat equation to be internally valid using the jackknife method for data splitting. Finally, %Fat equations developed in this study sample were tested in two independent samples of elderly women (71.1 years and 74.5 years) and one sample of younger women (33.4 years) shared by Baumgartner (1999) and Brodowicz (1999). Both independent studies used DEXA instruments manufactured by Lunar. New equations were derived for this application using only the variables measured in these independent studies as the predictor variables.

The modified prediction equations were reasonably correlated (r= .73, .81) with %Fat from DEXA (Lunar) in the elderly women, yet paired t-tests results showed that the new equations significantly underestimated %fat by 6.6%±3.9 (p≤0.001) (BROD), and 5.1%±4.5 (p≤0.001) (BAUM). An unexpected finding was the accurate prediction of %Fat in the younger women (δ = .07%±5.4; p = 0.45). The correlation between predicted and measured %Fat was also stronger (r = .89). However, the two methods were not interchangeable as a trend in the residuals indicated that %Fat was underpredicted at low body fat and overpredicted at high body fat in the younger women. A major finding of this study was that neither existing equations nor the newly derived equations were able to accurately and reliably predict body fat in independent samples of elderly women. Some of the prediction error can be attributed to inter-method differences and differences in DEXA manufacturer, but this lack of agreement also emphasizes the problem of sample specificity with regression equations. Equations will always perform better in the sample from which they were derived and must be interpreted with caution when applied externally. A second major finding of this research was that a single best equation did not exist for these data; rather, several alternative models provided similar equation statistics and regression coefficients. However, the combination of WT, HT (or BMI) and SF’s was better than SF’s alone. Nonetheless, this study demonstrated that a strong relationship between anthropometry and DEXA exists among elderly women and that internally valid equations can be proposed for this population. Moreover, it is reasonable to conclude that prediction equations based on DEXA have greater face validity in elderly women than those based on densitometry, as the DEXA model is associated with fewer assumptions. Due to the relatively small sample size, the new %Fat equation cannot be recommended at this time. However, this study shows promise for future use of DEXA and anthropometry in elderly women.

Franklin, Jodi L. A comparison of the Yellow Springs Instruments and the Accusport™ portable lactate analyzer for measuring blood lactate in cold environments, 2000. M.S., University of Wisconsin, La Crosse (Carl Foster). (28pp $5.00) PE 4135

The purpose of this study was to evaluate the validity of the Accusport™ portable blood lactate analyzer in cold environments as compared to a reference method (Yellow Springs Instruments enzyme electrode system [YSI]). It was hypothesized that the Accusport™ would not be accurate in cold environments (cold 1=5-10° C and cold 2=0° C). Subjects consisted of male and female well-trained nonathletes. A VO2max test and 2 additional tests were performed on an electrically braked cycle ergometer. Blood lactate and heart rates were measured using both the YSI and Accusport™ at rest and during the last 30 seconds of each testing stage. Blood samples of >50 µl were drawn from the fingertip and separated for analysis. A 25 µl sample was transferred to a buffer tube for YSI analysis in the lab at room temperature. The additional 25 µl sample was drawn for Accusport™ analysis under room temperature, cold 1, and cold 2 conditions. There was a consistent relationship between BL concentrations measured using the Accusport™ in all temperature environments measured in this study. However, BL concentrations achieved using the Accusport™ were about 25% greater than the reference method.


The purpose of this study was to design and examine the validity, reliability, and specificity of an aerobic dance exercisers (age 20.7±1.5 years) performed three maximal graded exercise tests (2-ADDBST; 1-treadmill test [TMT]). The independent variable was type of test (ADDBST, TMT). The physiological and perceptual dependent variables were HR (beats·min⁻¹), VO2 (ml·kg⁻¹·min⁻¹), % HR max, % VO2 max, VO2 peak (ml·kg⁻¹·min⁻¹), ventilation (Ve) (l·min⁻¹), ventilatory equivalent (Ve/VO2) (ml·min⁻¹), respiratory exchange ratio (RER), total exercise time (TET), and ratings of perceived exertion (RPE). The designed ADDBST protocol consisted of 6, 3-min incremental stages of aerobic dance step exercise. Step cadence was set at 128 beats·min⁻¹. Step height was increased from 8 inches to 10 inches after the 9th minute of exercise. The specific dance step movements included the alternate lead basic step, basic step with biceps
curl, knee raise with pull-down, repeater knee with pull-down, lateral lunge with pull-down, and the side squat with shoulder presses for Stages 1 through 6, respectively. Concurrent validity of the ADBST protocol was examined using a Pearson's product moment correlation coefficient between the ADBST and the TMT that indicated sufficient to high validity (r=.91, 95% confidence interval [CI]=.77-.97, r²=.83). Test-retest reliability was examined using intraclass correlation coefficients from a one-way analysis of variance (Baumgartner & Jackson, 1999). High reliability was found when responses for ADBST1 were compared to ADBST2 (R=.92, 95% [CI]=.80-.97, SEM=.24). Specificity of the ADBST was tested using paired t-tests for all dependent variables. A statistically and practically significant difference was found for max heart rate (t[17]=8.21, p=.0001, f=1.90). However, no significant difference was found for VO₂max (t[17]=1.54, p=.14, f=.36). The ADBST is both a valid and reliable protocol for assessing cardiorespiratory responses in aerobic dance exercisers. The findings of the present study, however, show mixed support for the use of an ADBST for aerobic dance exercisers. When prescribing exercise intensity for aerobic dancers, maximal responses obtained from a criterion treadmill test may be slightly lower than from an ADBST. Therefore, a maximal ADBST would be more specific if a precise maximal heart rate were deemed necessary. The use of the measured HR max from the treadmill testing for exercise prescription for aerobic dance exercisers may result in an underestimated training heart rate of 5-7 beats·min⁻¹, which would be approximately 2 ml·kg⁻¹·min⁻¹ during aerobic dance bench step exercise. The viability of an ADBST protocol used for testing the cardiorespiratory fitness of aerobic dance exercisers warrants further investigation.

Parker, Robert G. Allometric scaling of bench press strength by body mass and lean body mass in college-age men, 1999. M.S., Springfield College (Tina M. Manos). (156pp 2f $10.00) PE 4146

The investigation was designed to scale one repetition maximum bench press (1RMBP) scores by body mass (BM) and lean body mass (LBM). The simple ratio (SR) method of scaling (1-RMBP/BM) is the most common method of making strength comparisons of individuals of different size. The use of the SR method has been found to impose an unfair penalty on larger individuals. Trained college-age men (N=77) were evaluated in the 1-RMBP, weighed and assessed for LBM. The use of allometric analysis revealed that the SR method 1-RMBP/BM penalized larger individuals. The 1-RM/BP was found to be proportional to BM raised to the .63 power. The best scaling index would be 1-RMBP/BM.63. Further allometric analysis using LBM as the scaling variable indicated that the SR method of 1-RMBP/LBM is a valid scaling convention. Scaling via 1-RMBP/LBM is the preferred method of scaling when valid body fat assessment methods are available. Scaling via 1-RMBP/BM.63 should be used when body fat assessment is impractical.

Pellizzari, Victoria M. Validation of the Tanita TBF-305 analyzer, 1999. M.A., University of North Carolina, Chapel Hill (Robert McMurray). (79pp 1f $5.00) PE 4109

This study examined the validity and reliability of the Tanita TBF-305 bioimpedance analyzer. To test the validity, 59 men and women, aged 18-35 years, had their body fat measured using underwater weighing (UWW) and the Tanita. To test the reliability, 3 men and 7 women completed the Tanita testing on two separate days. There were no significant differences between percent fat obtained from the Tanita and UWW (p=.141); the correlation between the two measures was 0.74. The addition of W:H had no significant effect on predictability of the Tanita, but BMI significantly improved predictability of the Tanita for the women (r=.79). A repeated measures ANOVA showed no significant differences in test-retest scores (p=.298). It was concluded that, although reliable, the Tanita TBF-305 analyzer is not a valid tool for measuring percent body fat per criteria for significance in this study.

Reichert, Brent D. A validation of the KB1-C portable metabolic measurement system using the autocalibration feature, 2000. M.S., University of Wisconsin, La Crosse (Nancy Butts). (72pp 1f $5.00) PE 4127

The purpose of this study was to determine the validity of the Aerosport KB1-C portable metabolic measurement system (Aerosport, Ann Arbor, MI) using the autocalibration feature against the Quinton QMC metabolic measurement cart. Twenty healthy 18-30 year old men and women volunteered to participate in this study. All subjects were students, faculty, or staff of the University of Wisconsin-LaCrosse. Volume and gas calibrations were completed according to the specifications of the manufacturer. Validation of the QMC ventilation measurements was determined by the subjects performing an exercise test on a treadmill consisting of a standard warm-up at 3.5 mph and 10% grade, followed by 3, 5 minute workloads at a self-selected speed at inclines of 0, 2.5, and 5% grade. During this test, exhaled air was routed into the QMC and out the exhaust port into a Tissot spirometer during the final minute of each stage. Once the minute sample was collected in the Tissot, the air was forced out the exhaust port of the Tissot spirometer and through the mouthpiece of the KB1-C. Ventilation (VE) values measured by the KB1-C (STPD), QMC (BTPS), and Tissot spirometer (ATPS) were then converted to a standard volume (STPD) for comparison purposes. Comparison of physiological measures between the KB1-C and QMC was accomplished by each subject performing the same exercise test protocol as described above. During this test, exhaled air was routed into the QMC and out the exhaust port.
through the mouthpiece of the KB1-C for gas analysis. Repeated measures with appropriate post-hoc tests indicated no significant (p>0.05) differences existed between the VE measures of the QMC and Tissot spirometer up to 46.8 l·min⁻¹; however, there were significant (p<0.05) differences between the Tissot vs KB1-C at all workloads. When physiological measures were compared between the KB1-C and QMC, VE data were not significantly (p>0.05) different. No significant (p>0.05) differences were found for measures of \( F_{\text{EO2}} \); however, \( F_{\text{CO2}} \) values were significantly (p<0.05) different with both \( F_{\text{EO2}} \) and \( F_{\text{CO2}} \) values produced by the KB1-C consistently lower than the QMC. Oxygen consumption and VCO2 data were both found to be significantly (p<0.05) different, which produced similar RER values as the reference system, but cannot be termed accurate due to the error in both VO2 and VCO2. It was concluded that the KB1-C should not be utilized using the autocalibration procedure in a research capacity, due to significant inaccuracy in measurements provided by the unit.

Robinson, Jennifer M. *Assessment of the VISA-A questionnaire for Achilles tendinopathy and its correlation with imaging*, 2000. M.Sc., University of British Columbia (Jack Taunton). (89pp 1f $5.00) PE 4117

Because Achilles tendon disorders, which are common, have a significant morbidity among athletes, further research into efficacious treatments is necessary. Yet there is a lack of objective or quantifiable outcome measurement tools. The purpose of this thesis was to investigate outcome measurement tools used in Achilles tendinopathy research. In particular, clinical measures that quantify the severity of the patient’s condition and ultrasound and magnetic resonance imaging were examined. A 3-month prospective study was done: Forty five consecutive patients (27 men, 18 women; mean age 42 years, range 20-66 years) with 57 symptomatic and 33 asymptomatic Achilles tendons (mean duration 21 months, range 0.5 - 120 months) were admitted to the study. The VISA-A questionnaire had construct validity. The VISA-A scores of the 45 subjects correlated significantly (p<0.01) with their scores on two other clinical severity grading systems. There was also a significant difference in scores among the 45 symptomatic subjects (mean 63.75±16.81) compared to the VISA-A scores of 66 asymptomatic University students (mean 95.95±7.41) (p<0.01). The test-retest reliability was 0.930, the interrater reliability was 0.903, the intrarater reliability was 0.903 and the short term reliability was 0.805. Ultrasound had a sensitivity of 0.65 and specificity of 0.67 and an overall accuracy of 0.66. The addition of color and power doppler interrogation did not enhance the accuracy of US. MRI had a sensitivity of 0.56, a specificity of 0.94 and an overall accuracy of 0.68. At 3-month follow up, 7 of the 45 patients had improved, 37 remained the same, and 1 had worsened. Only the baseline VISA-A score correlated with the 3 month results (p<0.01). Neither US nor MRI was able to differentiate between cases that would improve and that would worsen. The VISA-A index of severity for Achilles tendon disorders offers a valid, reliable and quantifiable outcome measurement tool useful clinically and in research. Imaging lacked sensitivity and therefore was not suitable as an outcome measure. Neither imaging modality proved more accurate, but, because of cost and accessibility, US would be preferred when imaging is required.

Squire, Kathleen H. *A national revalidation and electronic configuration of the La Crosse Wellness Inventory*, 2000. M.P.H., University of Wisconsin, La Crosse (Gary Gilmore). (150pp 2f $10.00) PE 4125

Content validity of the 182-item La Crosse Wellness Inventory (LWI) was determined by review of literature and review by jury of experts. The national jury sample consisted of 25 selected experts aligned with one or more of the 9 areas of the LWI. Jury members were asked to rate the acceptability level of each statement on a 5-point Likert-type scale regarding its ability to assess a person’s level of wellness within the context of a particular wellness area. Additionally, jury members were encouraged to comment on any and all statements. Following jurification, 80 statements were revised, 6 statements were eliminated, and 1 statement was added. The revised LWI was comprised of 178 items. The LWI software was constructed utilizing Internet and Web-based technology. HyperText Markup Language (HTML) was adapted to construct the Web pages, and Java programming language was used to make the software interactive. The LWI software components included static Web pages, the client-side applet, and the server-side application. To complete the La Crosse Wellness Project, users are asked to enter their data into the Wellness Development Process in order to develop a personalized wellness plan.

Wiersma, Lenny D. *Conceptualization and development of the Sources of Enjoyment in Youth Sport Questionnaire*, 2000. D.P.E., Springfield College (Mimi Murray). (238pp 3f $15.00) PE 4143

Through the development of a quantitative measuring instrument, using content and construct validation methods, this study was designed to test the sources of enjoyment in youth sport model proposed by Scanlan and Lewthwaite (1986). In the first stage, items were developed through a review of the youth sport literature. Item-content relevance was established through an expert panel. The Sources of Enjoyment in Youth Sport Questionnaire (SEYSQ) was tested using an exploratory factor analysis of 856 athletes aged 12-18, from which six interpretable factors emerged. Confirmatory factor analyses were conducted on the 28-item questionnaire, with 896 athletes of the same ages on a six factor model of interest, which was tested against a single-factor and four-factor model of enjoyment. Two-secondary factor analyses were conducted...
on higher-order enjoyment models, in which the six sources were hypothesized to be explained by a larger set of factors. Initial support was found for the six-factor and both higher-order factor structures. Internal consistency of the SEYSQ was supported through alpha reliability and composite reliability methods. The practical implications of the findings are discussed in relation to how sport programs can be structured to maximize the enjoyment and motivation of youth sport athletes.

**PEDAGOGY**

Vosylius, Gaile. *A comparison of time management behaviors between the physical education setting and the coaching setting of five middle school teachers*, 2000. M.S.Ed., Northern Illinois University (Connie Fox). (73pp 1f $5.00) PE 4099

The problem was to introduce and compare differences in time management between physical education teaching and coaching settings. Subjects were physical education teachers and head basketball coaches in middle schools located throughout the suburban Chicago area. The computerized version of the Physical Education Teacher Assessment Instrument (PETAI; Phillips, Carlisle, & Steffen, 1988) was used to record the percentage of total time spent in various instructional and managerial behavior categories. The percentage of total time that teachers spent instructing was found to be significantly greater in the practice setting than in the PE class setting. The percentage of total time that teachers spent managing was significantly greater in the PE class setting than in practice. Teachers spent significantly more time using the following instructional behaviors: response presentation, performance feedback, and motivational feedback in the practice setting. The following managerial behaviors were found to be used significantly more in the PE class setting: beginning/ending class, equipment management, organization, and behavior management. The differences may have been caused by the numbers of children present in each setting, the attitudes and motivation levels of the children, or possibly the importance of teaching vs. coaching to the participants.

**SOCIOLOGY AND CULTURAL ANTHROPOLOGY**

Coleman, Gina M. *Time out: why aren’t more Black and Latino female students participating in intercollegiate sports?*, 2000. M.Ed., Massachusetts College of Liberal Arts (Ellen Barber). (86pp 1f $5.00) PE 4161

There has been an overwhelming amount of research written on the effects of Title IX, gender equity, and the impact of intercollegiate sports on female students. The absence of an abundance of information on female students of color, specifically Blacks and Latinos, inspired a study that examines this population at Williams College and questions why more Black and Latino female students are not participating in intercollegiate sports. Williams College is a highly selective co-educational liberal-arts institution in western Massachusetts. It has a population of approximately 2,200 students, 50% male and 50% female. The study identifies the actual intercollegiate sports participation rate of Black and Latino female students at Williams College at the beginning of the spring 2000 semester. The Black and Latino population on campus during the spring 2000 semester consisted of 127 students. The study takes an interpretivist approach in that it seeks to understand and find meaning in the lack of participation in this group of students. Data were collected through the triangulation of institutional documents, interviews, surveys, and focus groups. This study investigates what would make Black and Latino female students participate, to a greater degree, in intercollegiate sports at Williams College. The study examines the impact of intercollegiate athletic participation on Black and Latino female students at Williams College. Finally, the study inquires if Williams College is providing ample opportunities and a welcoming environment for Black and Latino female students in intercollegiate athletics. Findings showed that a high percentage of Black and Latino female non-athletes mentioned that their lack of athletic participation is based on a need to spend more time focused on academics, although Black and Latino female students who did participate in athletics have an average GPA that is .16 higher than that of their non-athletic counterparts. Athletes were more satisfied with their academic experience by 8%, and by 16% in their social experience than non-athletes. 74% of athletes had an ethnically diverse group of close friends in comparison to the 48% of non-athletes who mentioned the same. Non-athletes feel that Williams College is lacking in female coaching role models, especially coaching role models of color. Non-athletes express financial burdens that did not permit them to participate. Ultimately, according to the students, parents and educators have told them that minority students should have academics as their primary focus in college.

Mieszkalski, Kelly L. *Sexual harassment perceptions: collegiate female athletes and non-athletes*, 1999. M.A., University of North Carolina, Chapel Hill (Diane E. Stevens). (194pp 2f $10.00) PE 4108

Part of what defines sexual harassment is what an individual perceives as unwanted or inappropriate. Current definitions of sexual harassment in sport are based on non-sport research and consequently may not be valid. The present study was designed to assess differences between female collegiate athletes and non-athletes on perceptions of potential sexually harassing coach-athlete and professor-student interactions. The influence of moderator variables
on perceptions for the athlete sample was also determined. Subjects included 443 undergraduate students at four North Carolina universities. Exploratory factor analysis yielded 10 interpretable factors (5 per coach gender) representing various coach-female-athlete interactions (Verbal/Physical Sexual Advances, Non-Sport Specific Communications, Sport Specific Communications, Verbal/Physical Intrusions, and Non-Sport Social Interactions). Athletes significantly differed from non-athletes on 6 of the 10 sub-scales, and in each case athletes were more tolerant of potential sexually harassing behaviors. Athletes and non-athletes did not differ on perceptions of sexual harassment by a professor/instructor.

SPORST MARKETING

Northcott, Jasmine R. The nexus generation and marketing in the Canadian ski industry: a case study of three resorts, 2000. M.A., University of British Columbia (Robert E. Sparks). (120pp 2f $10.00) PE 4162

This study critically examined how three Canadian ski resorts market to the Nexus Generation (population cohort aged 18 to 35 years) by evaluating the marketing practices of three leading ski resorts owned by a major resort development company located in Canada. The research objectives were to critically review the resorts’ marketing methods for profiling and targeting the Nexus Generation, and evaluate the effectiveness of these methods based on established theory in generational marketing. The study followed a case study approach and a qualitative research methodology. Marketing Directors from the three ski resorts were recruited into the study and interviewed using semi-structured interview methods. Interviews were conducted on-site at the respective resorts in order to provide a more natural environment for the participants and to facilitate field observations and collection of marketing plans and materials. Data analysis focused on the resorts’ profiles and amenities, their target consumer groups, and their marketing approaches, including any use of generational marketing methods, and any targeting of Nexus. The results indicate that the ski resorts’ application of generational marketing as a marketing strategy and their perceptions of Nexus as a market segment correlated well with theories of generational marketing and the Nexus generation. The Nexus generation was not identified as a specific target market; however, it overlapped many of the target groups outlined by the ski resorts. Although not marketed to directly, Nexus was identified as an important group and in particular their vitality and youth were valued as a desirable quality to have associated with the resort. Generational marketing was used by each of the resorts to varying degrees; however, further steps could be taken in this area, such as determining major world and life experiences that have affected the attitudes of skiing consumers, including their perceptions of critical ski resort amenities and services, and their attitudes towards money and consumerism more generally. The analysis contributed to the literature by providing a concrete case study that critically evaluated generational marketing approaches at three Canadian ski resorts, and points the way for further use of generational marketing methods in the ski industry.

Randall, Jeff. An analysis of the backgrounds of professional baseball players, 2000. M.A., Ball State University (Marilyn Buck). (50pp 1f $5.00) PE 4163

The purpose of this study was to analyze the backgrounds of current professional baseball players to see if there is an advantage to a player by entering the professional ranks from high school, junior college, or a four-year university. Subjects included 7,859 drafted baseball players from the years 1990 through 1994, and 1,447 major league players from the major league rosters in 1998. Players were categorized into what educational level each entered professional baseball, what round they were drafted, and how many years they spent in the minor leagues. Percentages were used to find the most common background in professional baseball and to compare the two sets of data to see if the information was consistent. The results found that the majority of the players entering the minor leagues and those playing at the major league levels played at a four-year university. Players will now be able to analyze their own situation and background to determine when will be the best time for them to enter professional baseball.

DANCE

Barnick-Ben-Ezra, Barbara. Interpreting dance: circles of perception and spheres of experience, 2000. Ph.D., Texas Woman’s University (Penelope Hanstein). (123pp 2f $10.00) PE 4149

The purpose of this philosophical inquiry was to examine the process of interpretation and its role in constructing meaning within the context of viewing and understanding dance. A focus on process directed the search for an understanding of how the viewer engages in interpretive activity. An examination of: (1) the internal structures the viewer attends to in the process of watching and understanding dance; (2) the numerous layers of context which move the viewer beyond the immediacy of the dance itself; and (3) how these phenomena relate, interrelate, and integrate, provided a deeper understanding of what informs the viewer’s interpretive activity. The search for an understanding of the interpretive process for dance required a pluralistic approach allowing for its multivalent features. It is from this perspective that a link was developed between semiotics and hermeneutics bringing both structure and flexibility to this inquiry. In addition, the
theory models approach developed by Elizabeth Steiner (1978) and applied to Penelope Hanstein (1986, 1988, and 1999) was used to further illuminate the interpretation process. Susan Suleiman’s (1980) work in audience-oriented literary criticism and Louise Rosenblatt’s (1978) transactional theory of the literary work provided support for the development of my theoretical constructs. The development of the circles of perception as a theory model served as a visual tool to organize and synthesize the theoretical concepts related to the process of viewing a dance. The viewer’s accumulation of ideas and acquisition of knowledge related to the dance comes from (1) her or his responses to the internal structures of the dance; (2) her or his preconceptions that shape these responses; and (3) the contexts that shape or have shaped her or his preconceptions along with the motives and intentions that created contexts for the dance; all of which the viewer draws upon to shape an articulated response. By providing a way to organize the layering of what is going on in the process of viewing, the theory model facilitated the development of an explanatory model of the interpretation process as presented in this study as a sphere of experience. The dance interpretive process, conceptualized as a sphere of experience, involves an interweaving of our circles of perception. These circles include the layers of the features of the dance, of personal experience, and of contextual surroundings. These elements serve to frame, interconnect, and integrate our perceptions and guide the shaping of our ideas in our coming to understand the dance. Through this sphere of experiencing a dance, the work becomes personally meaningful.

Bateman, Joylyn. Choreographing as teaching / teaching as choreographing: dancing and dialoguing with Mark Taylor, 2000. M.F.A., Texas Woman’s University (Penelope Hanstein). (26pp 1f $5.00) PE 4124

This paper explores the relationship between the choreographic process and pedagogical process in the work of Dance Alloy Artistic Director, Mark Taylor. The information in this paper is based on interviews with Taylor as well as observations of him teaching and choreographing. This paper is also based on discussions with company members and participants’ experiences within a three-week workshop. Findings illustrate the connections between art making and teaching and lead to a discussion of the process of teaching/learning in which teacher and choreographer are integrated and play inseparable roles.

Christopher, Tara L. Application of LMA principles in ethnic dance training, 2000. M.A., Brigham Young University (Susanne Davis). (242pp 3f $15.00) PE 4133

Ethnic dance is the physical representation of the essence of a community, nationality, or religious group. Representing a nation requires an attention to and an understanding of the qualitative aspect, or intent, of movement and is vital to portraying the spirit of a nation. Principles from the Laban Movement Analysis (LMA) system clarify and train the body to embody the qualitative aspects of movement inherent in choreography, which defines the style of ethnic dance. This research is a comparison study between two beginning folk dance performance classes at Brigham Young University (BYU) to determine if the inclusion of LMA Principles at the beginning stages of dance training would affect the stylistic clarity between the two classes. Both teams were taught Dzinovsko Racinia from Bulgaria and Dunamenti Tancok from Hungary. The experimental class received instruction in LMA Principles during the learning process, while the control class did not. Three certified Laban Movement Analysts performed movement analyses for this research. An initial analysis of movement from Bulgaria and Hungary determined which aspects of the LMA framework to include in the teaching process. These findings were implemented into class instruction for the experimental team. Videotapes of Dzinovsko Racinia and Dunamenti Tancok taken on the final exam day were distributed to the analysts for the final analysis. This analysis was blind. Results from the control and experimental final analyses were compared to the initial analyses to determine which team performed the choreography closest to the original. Final analyses showed a broader variance between the control and experimental classes in the Hungarian choreography over the Bulgarian choreography. The experimental class scored closer to the initial analysis in both the Bulgarian and Hungarian choreographies. Analyst comments indicated that the experimental class danced with more body awareness, clarity of movement, core support, and attention to active effort than the control group. This research indicates that LMA Principles increase the student’s ability to understand and perform the qualitative aspects of choreography. An attention to the qualitative aspects of movement increases performer understanding of the essence of culture.

Olson, Shani. La pasion embridada: a technical and stylistic choreographic merging of ballet and flamenco, 1999. M.A., Brigham Young University (Sandra B. Allen). (85pp 1f $5.00) PE 4166

This thesis was an original choreographic work, merging classical ballet technique with aspects of flamenco Spanish dance, such as upper body styling, select foot work, musical choice, and costuming. The work was a three-movement suite that explored three different themes of flamenco dance: intense, passionate, and sensual; reflective, spiritual, and demonstrative of life and living; and, enthusiastic, celebratory, and joyous. The title of this choreographic thesis was La Pasión Embridaada, a Spanish phrase meaning bridled passion. The three movements were set to the musical selections of the Malagueña, Entre Rosas y Jazmines, and España Cañí, respectively. The
choreography was performed by dancers from Rocky Mountain Repertory Ballet, a pre-professional youth ballet company from Orem, Utah. The work was created over a fourteen month time period and had a two-phased procedure: preparation and presentation. The preparation phase included the following: 1) flamenco and Spanish dance research, 2) attendance at The Maria Benitez 1998 International Spanish Dance and Music Workshop in Sante Fe, New Mexico, 3) viewing films of Spanish ballets and flamenco dancing, 4) selecting the above-mentioned musical selections, 5) choreographing, 6) selecting the dancers from Rocky Mountain Repertory Ballet and rehearsing them, and 7) designing and constructing costumes. The presentation or performance phase of the procedure involved: 1) preparing a lighting design, 2) recording the master sound tape, 3) staging, 4) preparing program notes and publicity, 5) videotaping the work for a permanent record, and 6) presenting the final performances. The final performances were presented in the “Master’s Showcase” on March 11 and 12, 1999. This culmination of the choreographic thesis was successful in demonstrating the intense, powerful, and aesthetic partnership between classical ballet technique and flamenco dance.

Priest, Jill G. From silence to personal voice: the journey of an emerging artist, 1999. M.F.A., Texas Woman’s University (Penelope Hanstein). (30pp 1f $5.00) PE 4123

The incremental progression toward finding an individual choreographic process, and thus one’s own unique artistic voice, via assimilation and integration of experience and personal history over time, is the focus of this professional paper. Although the pathway toward developing an autonomous way of working is personal and unique to each individual artist, there are also common attributes in the journey of the evolving choreographic process. The understanding that it may gradually occur over an extended period of time as an assemblage of experience and personal history may be central to a maturing choreographic process, and thus one’s own unique artistic voice. The purpose of this paper is to examine the dance technique class as a teaching/learning environment comprised of diversity. Focusing on the ways a teacher can create a communal experience in which each person contributes to the class with her or his individual uniqueness, James Banks’ five dimensions of multicultural education are used as a theoretical framework for this inquiry. This study begins by examining the teaching/learning community and the role of cultural identity as it relates to teaching and learning dance as a communal art form. An analysis and interpretation of literary data on educational theory as well as personal observations and experiences help to provide a basis for finding connections between individuality and community in dance. Through “channels of experience,” students make connections to their own experiences as well as to those of others. Using a series of scenarios, a pedagogical model is developed to explain “openness” as it relates to individual cultural identity and the teaching and learning process in dance.

Savino, Cynthia. From individual to collective voice: the overlapping roles of choreographer, performer, and designer during the creation of Three Ligeti Etudes, 2000. M.F.A., Texas Woman’s University (Penelope Hanstein). (38pp 1f $5.00) PE 4164

The purpose of this paper is to explore the character of collaboration in the context of the creation of a dance work entitled Three Ligeti Etudes. An understanding of the process of collaboration and the development of the work is sought through a study of the ways in which choreographer Karrine Keithley, performer Mary Williford-Shade, and theatrical designer Marketa Fantova combined their individual voices and shared artistic roles to create the dance. An analysis of the community formed by collaborators, the interaction and influence among its members, and the development of the work produced, will help to frame an understanding of artistic collaboration that is not geographically bound, but spread out over the United States. Each of the artists will be interviewed about their collaboration, communication, influence, and inspiration in the context of the creation of this work. From this data will be inferred the ways in which collaborative role sharing influences an artistic whole and enriches the process and experience of making dance.

Stubbs, Christopher R. Ballroom dance in university education: developing a learning-theory based curricular model, 2000. M.A., Brigham Young University (Sara Lee Gibb). (186pp 2f $10.00) PE 4131

This study considers the potential role of ballroom dance in higher education. A philosophical fit between the physical, social, emotional, intellectual, and aesthetic contributions of ballroom dance to the individual and the learning theories proposed by Benjamin Bloom et al., Renata and Geoffrey Caine, Robert Coles, Consortium of Arts Educa-
Ballroom dance, as a discrete discipline of study, benefits from the breadth of other dance genres and academic subjects throughout the university curricula in order to develop its own scholarly base. For example, ballroom dance embraces disciplines as eclectic as biomechanics, history, humanities, music, physical education, physics, physiology, psychology, religion, and sociology. In its focus on such diverse elements, ballroom dance can help the individual gain a sense of biological, social, psychological, spiritual, and aesthetic identity and become grounded in fundamental values and life skills. An ideal university ballroom dance program, as extrapolated from the philosophical fit, includes elements that benefit the individual student, the teaching dynamic, the university curricula, and the broader community. Aspects that benefit the individual include social emphasis in the dancing context, technical skill development, teaching of emotional coping skills, teaching of fundamental musical concepts, choreographic and improvisational opportunities, encouragement of training with a consistent partner, competition with the aim of developing expression, and career guidance. Elements that benefit the teaching dynamic involve multiple progressive levels of skill development, contextual evaluation, maximization of ways in which students are exposed to ballroom dance, opportunities for students to teach other students, teachers knowing students personally, metaphoric teaching, and provision of courses in the theoretical aspects of ballroom dance. Components that benefit the university curricula comprise validation for multiple epistemologies and connection of other university disciplines with ballroom dancing. Factors that benefit the broader community consist of community focus and performance group participation.

BIOMECHANICS

Buescher, Bradley R. The segmental energetics in the take-off and landing phases of the modified countermovement jump in healthy females, 2000. M.Ed., Bowling Green State University (William A. Skelly). (92pp 1f $5.00) PE 4158

The purpose of this study was to identify the segmental power and segmental energy change of the individual body segments during the take-off and landing phases of a modified countermovement jump. Nine recreational female athletes (21.3±1.0 years; 67.5±8.6 kg) performed five trials of a modified countermovement jump for maximum vertical height. Their average vertical displacement was 33.2±3.5cm. Vertical ground reaction forces (960 Hz; six channels) and sagittal plane video data (120Hz) were collected for the entire trial on the right side of the body. After data collection the countermovement jump was divided into two conditions, the take-off and landing phases, for further analysis. Force platform and kinematic data were used to calculate the intersegmental power and segmental muscle power for the foot, shank, thigh, and trunk based on calculations in Elftman (1939) and Robertson and Winter (1980). Total segmental power was calculated as the net result of the previous calculations. Three separate one way ANOVAs were performed to determine if there was an interaction between the two conditions for the intersegmental power, the segmental muscle power, and the total power for each segment. Work by the reaction was observed to be negative in the take-off phase and positive in the landing phase for the foot, shank, and thigh. The opposite was found to be true for the trunk. The work by the muscles was observed to be positive for all segments in the take-off phase and negative in the landing phase. Total work was small in the foot, shank, and thigh, and larger in magnitude for the trunk (positive in take-off, negative in landing). Significant differences were found in all power measures except for intersegmental and muscle power at the shank and total power in the foot. Examination of the components of total segmental power provides a more detailed picture of what is occurring to the segments during a modified countermovement jump.

Cardillo, Cheryl M. Effects of a 30-minute walk on ground reaction forces during walking with an external load, 2000. M.S., University of Nevada (John Mercer). (79pp 1f $5.00) PE 4129

To investigate effects of a 30-minute walk on kinetics of walking with an external load, ten subjects performed five walking trials across a force platform for five conditions. Walking speed was 1.57m/s for all conditions. The first two conditions had subjects walk without (C1) and with (C2) backpack load. Subjects then walked on a treadmill at 1.57m/s for 30 minutes. At 10-minute intervals GRF data were collected. In comparing C1 and C2, dependent variables F1, F2, and Favg revealed increases of 10.45%, 13.68%, and 11.75% respectively (p<0.01) indicating a mechanical response. No effect for time was observed for any variable tested. Therefore, the null hypothesis that load does not have an effect on vertical GRF was rejected. The null hypothesis that time does not have an effect on vertical GRF was not rejected. Overall, forces were elevated during load carrying, which may result in added stress on anatomical structures.

Chou, Li-Shan. Measurements and predictions of obstructed and unobstructed gait, 1995. Ph.D., University of Illinois, Chicago (Shin-Min Song). (162pp 2f $10.00) PE 4165

Three studies were performed in this work to (1) predict the motion of the swing limb during level walking based on the criterion of minimum energy consumption, (2) test the hypothesis that the strategy used for stepping over
obstacles would be governed by the criterion of minimum energy consumption, and (3) investigate the effects of obstacle height on the kinematics of the lower limbs and the kinetics of the trailing limb. In the first study, an algorithm was developed to predict the minimum energy trajectory of the swing limb. The method of dynamic programming, a multi-stage optimization method, was applied to generate the optimum trajectory of the swing ankle which minimized the mechanical energy required to generate the moments of the joints of the lower extremities during the single support phase of gait. The predicted joint motion of the hip and knee of the swing limb were not significantly different from those experimentally measured. The predicted ground reaction forces were not significantly different from the measured ground reaction forces. Furthermore, the moments about the joints were not significantly different from those computed using the measured ground reaction forces and kinematics of the limbs. The results of this study support the hypothesis that human gait is energy efficient with regard to the mechanical energy required about the joints of the lower limbs. The hypothesis that the motion of the lower limbs when stepping over obstacles is governed by the criterion of minimum energy consumption was tested in the second study. The trajectories of the swing ankle during level walking and when stepping over obstacles of 51, 102, 152, and 203 mm heights were measured experimentally and predicted analytically. When stepping over obstacles, the predicted trajectories of the swing ankle were just high enough for the swing toe to clear the obstacles. The clearances measured between the obstacle and toe were significantly larger than those predicted, suggesting that safety was a criterion when stepping over obstacles. When stepping over obstacles the levels of work required to generate the measured trajectories were significantly larger than those required to produce the predicted trajectories. The amount of work necessary to generate the measured trajectories increased linearly with obstacle height and was significantly greater than that required when walking on level ground. The amount of work necessary to generate the predicted trajectories also increased linearly with obstacle height and, except for the lowest obstacle, was significantly larger than that predicted for level walking. The results suggest that when stepping over an obstacle additional energy is used to increase the clearance between the foot and obstacle in order to ensure a safe crossing. Thus, when crossing obstacles conservation of energy may become a less dominant criterion for governing the motion of the body. In the third study, we experimentally investigated the effects of obstacle height on the kinematics and kinetics of the lower limbs. The average toe-obstacle clearance was 121mm for the four obstacle heights which was nearly 100mm larger than the average toe-ground clearance occurring at mid-swing of obstacle-free level walking. The distance between the toe of the trailing limb during stance and the obstacle, prior to crossing the obstacle, was shorter than that of the leading limb. This resulted in less hip joint flexion-extension, more rapid knee flexion, and less toe-obstacle clearance than the leading limb. Thus, the trailing limb was found to be more challenged than the leading limb during early stance of the trailing limb prior to crossing the obstacle, the external flexion moment at the knee and hip joints and the dorsi-flexion moment at the ankle joint increased as obstacle height increased. During late stance of the trailing limb the external flexion moment at the knee and extension moment at the hip decreased as obstacle height increased.

Huffman, Scott J. Relationship of open chain isokinetic knee strength and step-up and over test performance in the assessment of lower extremity motor control, 2000. M.A., University of North Carolina, Chapel Hill (Kevin M. Guskiewicz). (53pp 1f $5.00) PE 4106

The use of isokinetic testing to evaluate an athlete’s ability to return to sport has been under debate in the sports medicine community. The purpose of this study was to explore the value of isokinetic testing by the development of prediction equations for motor control performance. Forty healthy college aged subjects participated in two testing sessions. Knee flexion and extension strength were tested both concentrically and eccentrically using the Biodex System 3 dynamometer. Motor control performance was assessed using a step-up-and-over test. Results of regression analysis revealed significant prediction equations for the step-up and impact portions of the motor control test. The strength of the prediction equations was not strong and needs to be interpreted with caution. Quadriceps eccentric peak torque provided the best predictor of those studied to determine motor control performance. Further research is needed to determine which variables best predict lower extremity motor control.

Johnson, Samuel T. A comparison of ground reaction forces during running and form skipping, 2000. M.S., University of Nevada (John Mercer). (72pp 1f $5.00) PE 4128

Following lower extremity injury an athlete may be able to walk within days; however, he or she may not be capable of running for weeks or even months. During this time, the athletic trainer provides the athlete with progressions to running. One activity that has been used successfully in this progression is the form skip. It remains unknown why athletes are capable of successfully performing the form skip before they can run. The purpose of this study was to investigate the ground reaction forces (GRF) during form skipping and running. Healthy subjects (N=9) ran and skipped across the force platform at a speed of 3.83 m·s⁻¹ (±5%) and 1.75 m·s⁻¹ (±5%) respectively. Three GRF variables were analyzed: average vertical GRF, maximum vertical GRF, and braking impulse normalized for time. Dependent t-tests (α=0.05) determined GRF during
running were significantly greater than during skipping. In conclusion, running produces greater GRF than form skipping in healthy subjects.


The purpose of this study was to investigate the causal mechanisms of flail-like motion using computer simulation. Flail-like motion is characterized by proximal-to-distal sequencing of the motions of the segments in a linked chain, and is often used when a large velocity of the distal endpoint is desired. This motion has been observed in many throwing, kicking and striking activities. A two-segment planar model of the upper extremity was created with torque generators at each joint. Newtonian mechanics were used to set up the equations of motion. An integration program solved for each segment’s angular velocity and angular position throughout time. The cause-effect relationships between the distal endpoint velocity and three mechanical parameters of the system were analyzed. Two of the parameters were kept constant to examine the effect of the third. In general, larger velocity values occurred with a large system angular momentum, a small configuration angle, and a large ratio between the distal and proximal segments’ angular velocities (the flail ratio). To determine the optimal timing of the distal torque generator after the onset of the proximal torque generator, a series of simulations were run over the same range of motion with various distal torque onset times. The optimal timing was one that was late enough to maintain a small configuration angle and lead to a large flail ratio, but early enough to generate a large amount of angular momentum and to reap the benefits of the flailing action before the end of the range of motion. A series of simulations were run without a distal torque generator. Intense flailing still occurred, due to motion-dependent torques. The distal endpoint velocity produced was only slightly smaller than the value obtained with a distal torque generator. Another series of simulations was run with reversal of the proximal joint torque. A larger distal endpoint velocity was produced. However, this velocity was very sensitive to errors in the timing of the reversal, and instantaneous reversal is physiologically impossible. Thus, reversal is probably not very helpful for producing a large distal endpoint velocity in real life.

Malley, Sharon L. Relationship between isokinetic and functional performance testing of the lower extremity, 2000. M.A., University of North Carolina, Chapel Hill (Kevin M. Guskiewicz). (58pp 1f $5.00) PE 4107

Isokinetic muscle testing of the lower extremity has often been investigated to determine functional progression or return to play guidelines in the athletic population. The purpose of this study was to determine if results of isokinetic testing of the knee flexors and extensors (concentric and eccentric) can predict functional performance on four functional activities. Statistical analysis revealed that concentric hamstring average peak torque can predict functional performance on a single-leg hop. In addition, concentric quadriceps average peak torque can predict functional performance on a co-contraction test and a shuttle run. These results conclude that isokinetic muscle testing can be a predictor of specific functional tasks, but due to its limited ability to assess neuromuscular control, may not yield enough information to be used as a single evaluative or assessment tool.

Morley, Joanna B. An examination of ground reaction forces in runners with various degrees of pronation, 2000. M.S., University of Nebraska, Omaha (Nicholas Stergiou). (109pp 2f $10.00) PE 4118

Few studies have examined the kinetic differences between normal runners and runners exhibiting overpronation, and an even smaller proportion of these studies have included measurements of medio-lateral ground reaction forces (M-L GRFs). The relationship between M-L GRFs and patterns of pronation is of considerable interest because of their commonality of side-side movement. The use of M-L GRFs to analyze various running characteristics, however, has been limited due to the lack of established reliable standards. The purpose of this study was to examine possible relationships between M-L GRFs and different degrees of pronation during running. A barefoot condition was also incorporated to observe possible interactions between changes in forces and movement patterns. Thirty subjects exhibiting varying degrees of dynamic pronation participated in this study. Subjects performed 10 running trials at a self-selected pace wearing normal athletic shoes, and an additional 10 trials running barefoot. Kinematic data were collected via videography (60 Hz), and kinetic data were obtained by means of a Kistler force platform (960 Hz). Based upon the results of this study, it was concluded that the amount of pronation had no effect on the magnitude of M-L GRFs as was previously expected. However, based upon relative times of occurrence, it was concluded that peak lateral GRFs are more closely associated to peak pronation than peak medial GRFs. This was found to be more evident in the barefoot condition. The barefoot condition was found to have a significant effect on selected kinematic and kinetic variables. Results obtained from associations of M-L GRFs and footwear revealed that shoes provided increased stability to the foot. The findings of this study may provide a basis of knowledge regarding associations between pronation, barefoot running, and M-L GRFs to aid in further research of this topic. The high variability related to individual subject data made it difficult to formulate any solid conclusions indicative of reliable M-L GRF standards. Thus, further research must be
performed in this area before knowledge gained can be used for practical applications such as for biomechanical studies, injury prevention, gait analyses, and rehabilitation.

Niemann-Carr, Nicole J. Effects of resistance training on the ground reaction forces during gait termination in older adults, 2000. M.S., Western Washington University (Kathleen Knutzen). (106pp 2f $10.00) PE 4116

Some aspect of gait such as turning or stopping has been indicated in almost all incidences of falls in older adults. However, gait termination has not been studied in the older adult population and has rarely been studied at all. This study was designed to examine the effects of strength training on gait termination in older adults, as measured by ground reaction forces. Eighteen male and female subjects, over 60 years of age, were divided into a control group (no resistance training) and a training group (eight weeks of progressive resistance weight training, three days per week). Trained and control subjects were tested on a force platform before and after the eight week period. Improvements in muscular strength ranged from 25% to 49% over the different exercises tested. Leg press (p=.001) and biceps curl (p=.003) demonstrated significant changes. Significant changes in gait termination were seen in the vertical and antero-posterior directions with no significant results for the mediolateral or center of pressure forces. There was a significant difference in time to the first vertical maximum (p=.05), propelling maximum (p=.04), time to propelling maximum (p=.04), propelling impulse (p=.017), and braking maximum (p=.037). Although statistically significant results were limited, the trend indicated by the current study was that the group who strength trained increased the force applied in gait termination (p=.017), and braking maximum (p=.037). Although statistically significant results were limited, the trend indicated by the current study was that the group who strength trained increased the force applied in gait termination and did so in a quicker amount of time.

Paradis, Seth A. The relationship between knee joint angle, stretch-shorten cycle performance, and jump distance in ski jumping, 2000. M.S., University of Wisconsin, La Crosse (Carl Foster). (31pp 1f $5.00) PE 4139

This investigation examined the relationship between knee angle, stretch-shorten cycle performance, and jump distance in ski jumping. 44 elite ski jumpers were video taped at 120 Hz. Hip, knee, and ankle displacements were digitized to examine the relationship between the knee joint angle, stretch-shorten cycle performance, and jump distance in ski jumping. Jump distance was recorded for comparison. Average distance jumped was 99.03±11.6 m. During the stretch-shorten cycle movement, the average amount of knee flexion was -6.6±3.9° and the average amount of knee extension was 8.8±4.8°. A significant (p=0.014) quadratic relationship was found between the amount of knee flexion and jump distance. The knee joint extension velocity averaged 9.2±0.8 radians/s, but was not found to be significantly related to jump distance. The quadratic relationship between jump distance and the amount of knee joint flexion demonstrated an optimal knee flexion range for maximizing jump distance. This study suggests that when elite jumpers utilize an optimal stretch-shorten movement, in combination with proper form on the take-off table and in the air, they produce longer jump distances.

Petersen, Tianna S. Effects of slide board training on the lateral movement of college-aged football players, 2000. M.S., University of Wisconsin, La Crosse (John Porcari). (97pp 1f $5.00) PE 4140

The purpose of this study was to determine if training on the slide board would enhance lateral motion in collegiate football players. Forty-one collegiate football players (mean age 20.1 years) completed either a 10-week weight training (WT) or weight training plus slide board (WTSB) program. The following pre- and post-tests were administered: the lateral shuttle run (LSR), the lower extremity functional test (L.E.F.T.), the cone test, the box test, and the squat and bench press tests. Following the pre-testing evaluation, subjects were randomized into a WT group (N=17) and a WTSB group (N=24) based on their pre-testing strength and agility scores. Both groups underwent 10-weeks of weight training; however, the WTSB group added a 3-day/ week slide board training. Data were analyzed using a 2-way ANOVA with repeated measures. It was found that there were significant differences (p<.05) in the pre- and posttests within both groups for the squat and bench press, the LSR, L.E.F.T., and cone test performances, but differences between groups were not significant (p>.05). For the box test, there were different responses between groups from pre- to post-testing. The WT had a significantly (p<.05) lower score on post-testing than pre-testing, and this decline in performance was significantly (p<.05) different from the responses of the WTSB group. In conclusion, it appeared that slide board training had no beneficial effect for collegiate football players.

Pucsok, Jozsef. A kinetic and kinematic analysis of the Harai-goshi judo technique, 2000. M.S., Slippery Rock University (Nelson Ng). (76pp 1f $5.00) PE 4153

The purpose of this study was to analyze and compare the kinetic and kinematic characteristics of the Harai-goshi throwing technique. A heterogeneous group of 28 male and female Judo players, novice and advanced; participated in this study. Each subject (Tori), barefoot and dressed in Judogi, was randomly assigned to perform three successful trials of the technique to the right side. Kinetic and kinematic data were collected by utilizing the Kistler Instrument Corporation Multicomponent Force Measuring Platform System and the Peak Technologies Motion Video Analysis System. Data were collected in order to quantitatively and qualitatively analyze the horizontal and vertical
forces of the support leg, and the horizontal and vertical velocities of the sweeping leg during execution. Results revealed a significant difference between novice and advanced Judo players in horizontal force application. In addition, the investigator found significant relationships among mean horizontal force application and horizontal leg sweep velocity in 19 of the 28 participants. The results suggest (1) leg sweep velocity is a function of support leg force application; and (2) horizontal leg sweep velocity plays a primary role in good technical execution of the Harai-goshi throw.


No-glove, leather glove, nitrile glove, and vinyl glove conditions were evaluated to determine the effects on grip strength and 3-point pinch. Forty-one adult volunteers from a local university and local hospital participated in the 2-day study. The order of the testing was randomly assigned. A hydraulic hand dynamometer and a hydraulic pinch gauge were utilized to evaluate grip strength and 3-point pinch with no glove and with each of the glove types. Grip strength and 3-point pinch were tested on separate days. Results showed statistically significant differences (p<.05) between the no-glove versus leather glove, no-glove versus nitrile glove, no-glove versus vinyl glove, leather glove versus nitrile glove, and leather glove versus vinyl glove for grip strength. There was no statistically significant difference between the nitrile glove versus vinyl glove for grip strength. Results also showed statistically significant differences (p<.05) between the no-glove versus leather glove, leather glove versus nitrile glove, and leather glove versus vinyl glove for the 3-point pinch tests. There were no statistically significant differences between the no glove versus nitrile glove, no-glove versus vinyl glove, and nitrile glove versus vinyl glove for the 3-point pinch tests. The results indicate that glove type may have clinical applications for occupational and physical therapists working with clients who utilize gloves in the workplace.

Sprules, Erica B. The biomechanical effects of crank arm length on cycling mechanics, 2000. M.Sc., University of British Columbia (David J. Sanderson). (141pp 2f $10.00) PE 4120

The hypothesis of the current investigation was that there existed a relationship between anthropometry (total leg length, thigh length and shank length) and the crank length permitting the lowest heart rate at a given work rate (optimum crank length). In order to understand the mechanisms governing this relationship, segmental energies, average effective forces and average linear velocities of the foot were calculated. Sixteen avid cyclists completed one ride at each of 6 randomly presented crank lengths (120 mm, 140 mm, 160 mm, 180 mm, 200 mm and 220 mm). Subjects rode at a power output that elicited a heart rate response of approximately 155 bpm while riding with 160 mm cranks and were required to maintain a constant cadence of 90 rpm. During each crank length condition, pedal forces and heart rate were measured and videotape was collected. A multiple regression revealed that neither the average effective force, nor the average resultant linear velocity of the foot predicted the heart rates elicited across all crank lengths. A repeated measures ANOVA showed that the lowest segmental energies occurred at the shortest crank length. Optimum crank length was calculated for each subject and a multiple regression revealed that 51% of the variance in optimum crank length could be predicted by the following equation:

\[ \text{optimum crank length (mm)} = (18.971 \times \text{shank length}) - (7.438 \times \text{total leg length}) + 90.679 \]

However, almost all subjects' optimum crank lengths were in the range of 120 mm to 160 mm, a grouping of cranks that elicited statistically similar physiological responses and that includes crank lengths very close to the industry standard of 170 mm. It was therefore the recommendation of the investigator that crank lengths need not be changed from the industry standard of 170 mm for individuals of various leg lengths, as optimum crank lengths predicted from leg length measures do not differ significantly in terms of physiological responses from crank lengths very close to the current industry standard.

Stone, Corey W. The effect of keyboard design on finger, forearm, and shoulder muscle activity, 2000. M.S., University of Iowa (Warren G. Darling). (129pp 2f $10.00) PE 4115

EMG activity of finger and postural muscles during typing on three different types of keyboards was compared. The keyboards tested were Dell’s QuietKey (representing a standard design), Microsoft’s Natural (representing a modern fixed-split ergonomic design), and Kinesis’ Contour (an alternative non-adjustable ergonomic design). The muscle activity of seven subjects’ flexor digitorum superficialis, extensor digitorum communis, extensor carpi radialis brevis, and left and right trapezius were recorded with surface EMG electrodes. FDS and EDC efficiency were also calculated. Measurements consisted of 10-second recordings while subjects typed a brief segment of text on each keyboard at a 30-words-per-minute pace, a comfortable typing speed, and at a fast typing speed. Results showed that FDS, EDC, and ECRB activity generally increased as typing speed increased, but trapezius activity did not. Few differences in muscle activity were found when using different keyboards, except that FDS activity was higher when using the Kinesis keyboard than when using the Natural keyboard, and FDS efficiency was lower when using the Kinesis than when using the standard or Natural keyboards. Slightly lower EDC and ECRB activity was seen when using the Kinesis keyboard, but differences were not statistically significant. It was
concluded that muscle activity generally increases with typing speed, and typists achieve optimal efficiency when typing at comfortable and fast speeds, rather than at slower-than-normal speeds. It was also concluded that keyboard design has only small effects on muscle activity. Use of the Kinesis keyboard was associated with a trend of lower EDC and ECRB activity, but significantly higher FDS activity and lower FDS efficiency. A study including greater numbers of subjects may have been necessary to detect more significant differences in muscle activity when using the different keyboards. Additionally, surface EMG recordings may not be sufficiently sensitive to show small differences in muscle activity when using different keyboards.

Tricoli, Valmor. *Internal vs. external velocity: effects of strength training protocols on velocity-specific adaptations and human skeletal muscle variables*, 2000. Ph.D., Brigham Young University (Mark D. Ricard). (146 pp 2f $10.00) PE 4130

It has been suggested that velocity specific adaptations to strength training may be related to how fast a muscle group contracts (internal velocity) regardless of external resistance (external velocity). This study was designed to investigate the effects of 8 weeks of high velocity isokinetic concentric and isometric ballistic strength training on velocity-specific adaptations. In addition, modifications in muscle fiber type and cross sectional area (CSA), myosin velocity-specific adaptations. In addition, modifications in muscle fiber type and CSA, myosin heavy chain (MHC) isoforms, and neuromuscular adaptations were also assessed. Twenty adult male subjects were randomly divided into two training groups: isokinetic concentric at 300°·sec⁻¹ (IC, n=9) and isometric ballistic at 60°·sec⁻¹ (IB, n=11). Both groups performed maximum knee extension despite the external resistance. All subjects were pre- and post-tested for peak torque and peak power at 60, 120, 180, 240, and 300°·sec⁻¹, maximum isometric progressive contraction (MIPC), and maximum isometric ballistic contraction (MIBC). Electromyography signals (EMG) were recorded from the vastus lateralis (VL) and vastus medialis (VM) muscles. Electromechanical delay (EMD), peak and average rate of force development (RFDpeak and RFDaverage), and time to peak torque (TPT) were calculated. Muscle biopsy samples were extracted from the VL and analyzed for changes in CSA, muscle fiber type, and MHC isoform composition. The results showed that muscle fiber type and CSA, EMD, TPT, and EMG did not change significantly in either the IC or IB group. Myosin heavy chain types I and IIa percentage changed from 32.8% to 41.9% and from 52.4% to 42.5%, respectively, in the IC group (P<0.05). Maximum isometric progressive contraction, MIBC, and RFDpeak improved significantly in both groups. Significant increases (P<0.05) in peak torque and peak power were observed only in the IC group. The greatest change in torque occurred at 60°·sec⁻¹ (21.7%) followed by 180 (17.5%), 240 (17.3%), 120 (13.5%), and 300°·sec⁻¹ (12%). Power increased 12% to 18% at all velocities with exception of 60°/sec. We conclude that training involving external velocity increased both isokinetic concentric and isometric torque, whereas training with internal velocity improved only isometric torque production.


The effects of periodized isotonic strength training on subjects (N=69) utilizing either the power clean exercise (PC), the parallel squat exercise (PS), or no isotonic strength training (NT), were examined on the maximal tested performance of a no upper body counter movement modified vertical jump. Three test periods (TP1, TP2, TP3) were separated by 7 and 5 weeks of training. Dependent variables included measures of force (PCVF), impulse (TCVI), angular velocity (PCAVHKA), and vertical displacement (PCVDCCM), (LEPCCM), (LEADHKA). PCAVHKA at the hip (p<0.05) for the PC and NT groups was highest, at TP1, decreased for PC and NT at TP2, only to increase for PC and continue to decrease for NT at TP3. TCVI was higher (p<0.05) for both PC and PS than NT from TP1 through TP3. Overall, TCVI increased from TP1 to TP2 for PC, PS, and NT, only to drop by TP3 for PC, PS, and NT. LEADHKA showed increased plantar flexion (p<0.05) from TP2 to TP3 for PC, PS, and NT. Periodized isotonic strength training had little effect on performance variables of a maximal modified vertical jump test.


In recent years, the role of physical activity for the development and maintenance of a healthy skeleton and for the prevention of osteoporosis has garnered significant research interest. These studies have revealed that high impact loads with an unusual strain distribution are generally thought to be more effective in eliciting an osteogenic response than low impact repetitive activities. Also, immature bones appear to have a greater capacity to adapt to mechanical loads than mature bone. Childhood intervention programs that utilized different weight bearing activities and games, including jumping, have demonstrated a positive bone response to mechanical loading (McKay et al., 2000, Bradney et al., 1998, Morris et al., 1997, Heinonen et al., in press). However, the biomechanical characteristics of effective interventions have never been described. We addressed the question “what ground reaction forces (GRFs) are associated with pediatric mechanical loading intervention programs?” To accomplish this we measured the maximum GRF, rates of force, impulses, and time to maximum force for twelve different
jumping activities on a Kistler 9251A force platform (Winterthur, Switzerland). Jumps measured included drop jumps from 10, 30 and 50 cm, followed by a plyometric jump, submaximal and maximal jumping jacks, alternating feet, counter movement jumps, and side to side jumps over 10 and 20 cm foam barriers. We also examined the relationship between bone mineral density (BMD) at the proximal femur, physical activity (PA), and dynamic power. The subjects were 70 children (36 boys and 34 girls), 8.3-11.7 years old. Height (cm) and mass (kg) were measured using standard techniques. BMD (g/cm²) at the hip and lean and fat mass (g) from the total body scan were assessed by dual energy X-ray absorptiometry (DXA, Hologic Inc). PA was assessed by questionnaire and a composite loading activity score was derived for each subject. Dynamic power was assessed with a vertical and standing long jump using standard procedures. Subjects ranged in height from 128.4-172.6 cm and with mass of 25.0-57.0 kg, on average. Mean (SD) for vertical jump was 24.2 (5.5) cm and 135.2 (16.6) cm for standing long jump. The children engaged in loaded PA an average of 5.7 (5.2) hours per week. BMD (g/cm²) for total proximal femur, femoral neck, and trochanter was 0.70 (0.09), 0.67 (0.08) and 0.58 (0.08), respectively. The highest mean maximum GRFs, normalized for body weight (BW), were generated from the plyometric portion of the drop jumps and the counter movement jump (on average 5 BW) compared to 3.5 BW for jumping jacks. Similarly, highest rates of force were 514 BW/sec for the plyometric jump from 10 cm, and 493 BW/sec for the counter movement jump. In hierarchical regression, lean mass (beta=0.56) and long jump distance (beta=0.33) were significant predictors of femoral neck BMD, accounting for 42% of the total variance. Our findings demonstrated that relatively high and diverse GRFs and rates of force are generated by jumps included in a pediatric exercise intervention trial. As forces at the hip are known to be approximately 3 times the measured GRF (Bassey et al., 1997), the GRFs measured in the present study would be associated with forces 15 BW at the proximal femur. These findings could be used to modify ongoing interventions or to develop new targeted interventions for bone health in children.

**SPORTS MEDICINE**

Bauer, Jeremy. *Kinetics and kinematics of prepubertal children participating in osteogenic physical activity*, 2000. M.S., Oregon State University (Gerald A. Smith). (97pp $5.00) PE 4103

Recent reports in exercise related bone research have shown increased bone mineral content (BMC) at the femoral neck for prepubescent children participating in exercise programs consisting of repeated drop landings from a height of 61 cm. Increases in BMC from this type of exercise are believed to be the result of both high rate and magnitude of loading at the proximal femur. However, the dynamic characteristics associated with these landings in children have not been studied. To describe the dynamic characteristics of children during landing and to quantify the forces associated with an activity associated with increases in bone mass, 13 prepubescent children (males=8, females=5, age 9.3±0.7 years) who had previously completed drop landings over a 7 month period as part of an exercise intervention to increase bone mass participated in this research. Each subject performed 100 drop landings onto a force plate from a height of 61 cm. Ground reaction forces and two-dimensional kinematic data were recorded. Hip joint reaction forces were calculated using inverse dynamics based on a four segment rigid body model. Vertical ground reaction force and displacement data were fit to two single-degree-of-freedom models, the Voigt and standard linear solid (SLS). The goodness of fit was quantified using the standard deviation of the error (SDE) between the experimental and the predicted data. Peak vertical ground reaction forces were 8.5±2.2 (mean±SD) body weights (BW), while hip joint reactions were 6.0±1.8 BW. Loading rates for ground reaction forces during initial impact were in excess of 470 BW/s. Across 100 jump trials, ground reaction forces changed significantly for 5 subjects (4 increase, 1 decrease, p<0.05) but were unchanged as a group. The SLS and Voigt models replicated the displacement traces well (SDE = 0.003 m and 0.001 m respectively). However, in fitting force data, the SLS outperformed the Voigt model (SDE = 580 N and 493 N respectively), but slightly under-predicted peak forces by 13%. Comparing force characteristics from drop landing to force characteristics known to be osteogenic, we can see how drop landings contribute to the osteogenic stimulus. The models used to represent children during drop landing closely fit displacement data, but did not replicate the time history of the impact force peaks thought to be important to osteogenesis. Quantification of exercises known to increase bone mass provides a basis on which to develop and implement additional exercise interventions for the purpose of increasing bone mass.

Brinton, Maria. *Effects of posture specific therapeutic exercise on chronic back pain and disability*, 1999. Ph.D., Brigham Young University (Shane S. Schulthies). (93pp $5.00) PE 4114

Sixty-four people with chronic back or neck pain (>3 months) were randomly assigned to three groups to evaluate the effectiveness of the Pneu-Back protocol and therapeutic exercise in reducing pain, reducing disability and changing posture. Subjects in group one (chair group) received the Pneu-Back™ treatment protocol, which included back extension exercise on the Pneu-Back™ chair, and instruction and supervision in back and neck exercises and posture modification. Subjects in group two (exercise
group) received instruction and supervision in back and neck exercises and posture modification. Subjects in groups one and two were seen for treatment twice a week for the 6 weeks. Group three (control) received no intervention of any kind. Pain, disability and posture were measured pre-, mid-, and post-intervention. The data were analyzed using random coefficient growth curves. Subjects in the two treatment groups improved in pain and disability scores compared to the control group, but there was no difference in improvement between treatment groups. The inclusion of the Pneu-Back™ chair exercises had no additional effect on treatment outcomes. There were no consistent trends in posture changes between the groups.

Evans, Rachel. Effects of warm-up prior to eccentric exercise on indirect markers of muscle damage, 2000. Ph.D., Brigham Young University (Allen C. Parcell). (133pp 2f $10.00) PE 4132

This goal of this study was to test the influence of active and passive warm-up, conducted prior to eccentric exercise, on indirect markers of muscle damage. A 5x5 factorial with repeated measures on one factor guided this study. Untrained subjects (N=43) were treated with one of five treatment groups: low heat passive warm-up, high heat passive warm-up, or active warm-up preceding eccentric exercise, eccentric exercise without warm-up, or high heat passive warm-up without exercise. Passive warm-up was achieved by applying pulsed short-wave diathermy to the elbow flexors, and active warm-up was achieved by concentrically contracting the elbow flexors. Pilot work demonstrated that the low and high passive warm-up treatments using pulsed short-wave diathermy resulted in an approximate 1°C and 3.5°C rise in muscle temperature of the biceps brachii, respectively, taken at a depth of two cm. The active warm-up treatment resulted in approximately a 1°C temperature rise. The effects of treatments were noted on creatine kinase activity, strength, range of motion, swelling, and muscle soreness at five times: prior to treatment (baseline) and at 24, 48, 72, and 168 hours following treatment. The data were analyzed with an overall MANOVA using NCSS 2000 software, followed by multiple ANOVA’s and Tukey-Kramer post-hoc tests if significant main effects or interactions were found. Statistical significance was set at P<0.05. Heat alone did not affect any marker of muscle damage, and was excluded from further analysis. There were no differences between the remaining groups for any dependent variable at any time. As observed in numerous similar studies, significant changes across time followed eccentric exercise: (1) creatine kinase activity was elevated from baseline at 72h (P=0.004); (2) strength declined by 34-40% at 24h (P<0.05), and recovered in a similar fashion for all groups; (3) range of motion decreased from baseline at 24h, 48h and 72h (P<0.05); and (4) soreness increased at 24h, 48h and 72h (P<0.05). We conclude that warm-up does not appear to prevent, attenuate, or resolve more quickly, the clinical symptoms of eccentric muscle damage as produced in this study.

Jorden, Ryan A. Influence of ankle orthoses on ankle joint motion and postural stability before and after exercise, 2000. M.S., Oregon State University (Rod A. Harter). (109pp 2f $10.00) PE 4102

Ankle injuries comprise more than 15% of all sports injuries worldwide. The efficacy of ankle taping for injury prevention has long been under scrutiny as numerous studies have shown that tape rapidly loses its ability to constrain ankle motion with exercise. Consequently, ankle braces (orthoses) are being used with increasing frequency for the prevention and functional management of ankle injuries. However, the motion restraining qualities of ankle orthoses have not been widely evaluated in closed kinetic chain environments under physiologic loads. The primary purpose of this study was to compare the abilities of four ankle orthoses (ankle taping, lace-up brace, semirigid orthosis and hybrid brace) against a control condition (no brace or tape) to control subtalar and talocrural motion during running on a laterally-tilted treadmill at 16.2 km/h before and after exercise. It has been hypothesized that ankle orthoses make a secondary contribution to injury prevention through enhanced proprioception. The secondary purpose of this study was to quantify that the effects of the aforementioned ankle orthoses on these two variables supports our contention that reports of the motion controlling properties of ankle orthoses measured in open kinetic chain environments should not be used to infer the response characteristics of these same orthoses under dynamic, physiologic loads. To address the second question, data were analyzed using 3-way univariate ANOVAs. Subjects’ postural stability was assessed using a Biodex Balance System with eyes open and eyes closed conditions, before and after an exercise bout. The ankle orthoses evaluated did not influence postural stability as measured by mediolateral sway index, anteroposterior sway index, and overall sway index. Removal of visual perception via blindfolding resulted in significant decreases in all three measures of postural stability (p=.001). There was poor association among the closed chain postural stability parameters and the open chain AROM measures. These correlations ranged from r=.04 to .17, indicating minimal relationship between the amount of AROM permitted by the orthoses and postural stability as quantified by this method.

The study was designed to compare bone mineral density at multiple sites and for the total body in prepubertal gymnasts and swimmers. The study was also designed to develop a method for quantifying and qualifying the impact load activity common to gymnastics. The subjects in this study were 8 female gymnasts and swimmers aged 10 to 13 years old. Bone mineral density was measured at five sites: the left femoral trochanter; the left femoral Ward’s triangle; the left femoral neck; a portion of the lumbar spine (L5–L3); and the total body. A significant difference (p<.05) was found in body weight between gymnasts and swimmers. No significant (p>.05) differences existed in bone mineral density measurements at five sites between gymnasts and swimmers. Regression analyses were used to predict bone mineral density measurements using body weight for each athletic group at each site. Using the predicted scores for bone mineral density, no significant (p>.05) differences were found between gymnasts and swimmers. The impact data were not reported due to the large number of movements that were performed by each gymnast. Suggestions for future research include a more refined technique of analyzing and measuring impact activity in gymnastics.

Lumpkin, Kelly J. *The effect of heat and ice on hamstring flexibility utilizing proprioceptive neuromuscular facilitation stretching*, 1999. M.S., Slippery Rock University (Robert Arnhold). (60pp 1f $5.00) PE 4096

The purpose of this study was to investigate the short-term flexibility of the hamstring muscle group while stretching alone, stretching with ice, and stretching with heat. Static stretching and proprioceptive neuromuscular facilitation were also compared. The 30 female subjects were collegiate athletes from Cleveland, Tennessee. Data were collected in training rooms on standard treatment tables by performing a pre-test and post-test measured with a goniometer. The treatment administered was a static stretch, proprioceptive stretch with ice, proprioceptive stretch with heat. The stretching techniques both consisted of 600 seconds or rest. The proprioceptive stretch was similar to the hold-relax technique. An ANOVA revealed proprioceptive stretching to be more significant than a static stretch as compared to the control group. When comparing proprioceptive stretch, proprioceptive stretch with ice, and proprioceptive stretch with heat there was no significant difference in accordance to a one-way ANOVA.

McLellan, Ernest W. *The effect of static stretching on peak power and peak velocity during the bench press*, 2000. M.S., University of Memphis (Andrew Fry). (33pp 1f $5.00) PE 4100

Previous research has shown that, theoretically, static stretching has a negative effect on muscles producing maximum force although the results are equivocal. Therefore, the purpose of this study was to examine the effect of static stretching on peak power (PP) and peak velocity (PV) while performing the bench press exercise. Forty high school athletes (n=40; average age±SD =16.0±1.0 years.) participated in 3 testing sessions. During test 1, a 1 RM was established for each subject on the bench press. Test sessions 2 & 3 consisted of a general, total-body warm-up, an exercise-specific warm-up, and the criterion lift at 85% of the subjects’ 1 RM. A portable Fitro-Dyne unit connected to the bar was used to calculate PP and PV. A static stretching regimen (independent variable) was randomly implemented prior to the tested lift in one of the sessions. Results indicated that static stretching had a significant (p<0.0001) effect on PP (no stretch=366.6±115.7 W, with stretch=282.7±111.4 W) and PV (no stretch=0.413±0.103 m·s, with stretch=0.302±0.086 m·s). These data suggest that a static stretching regimen immediately prior to performance would have a detrimental effect on maximum power and maximum velocity for the bench press exercise.

Ross, Scott E. *Effect of lower limb dominance on dynamic postural stability*, 2000. M.A., University of North Carolina, Chapel Hill (Kevin M. Guskiewicz). (81pp 1f $5.00) PE 4111

The purpose of this scientific research study was to determine the contribution of muscular strength, static balance, and knee kinematics of the lower limb on dynamic postural stability measured during a jump down maneuver. Thirty (15 males/15 females) recreational athletes were tested on the static balance/jump down maneuver tests and the strength test for the lower limb. Statistical analysis revealed the kicking limb was significantly stronger with plantar flexion, knee extension, and knee flexion. In addition, the kicking limb displayed greater peak posterior-lateral GRFs. A multiple backward regression analysis revealed that the kicking limb displayed an optimally stable biomechanical landing profile. These results suggest that the kicking limb is the more dominant limb. Clinicians may evaluate an athlete’s return to competition according to the biomechanical landing profile. Observational differences between the kicking and stance limb may be a result of limb dominance and not of an existing pathology.


The purpose of this study was to characterize glenohumeral joint laxity and stiffness using instrumented arthrometry. To evaluate the validity of an instrumented measurement system we compared cutaneous and bone-pinned measures of laxity and stiffness that replicate previously reported in vivo methodology. Characterization of capsular laxity was achieved through determination of the sagittal plane translational area at increasing levels of quantified force. Finally, a method for increasing the
objectivity of the standard manual laxity examination was developed for the orthopaedic clinician to quantify humeral head translation and capsular volume in vivo. We hypothesized that: 1) cutaneous measures could accurately predict bone-pinned measures, 2) capsular laxity would increase with increasing levels of applied force, and 3) manual cutaneous, manual bone-pinned, and force-displacement bone-pinned measures of translation would be equal. Thirty fresh frozen cadaveric shoulder specimens (mean age =70±14 years) were tested. The shoulders were thawed and mounted to a custom-made shoulder-testing apparatus. Displacement was measured using an electromagnetic tracking system. Sensors were secured cutaneously and with bone-pins to the scapula and humerus. Force-displacement testing was performed using a load applicator and manual displacement testing utilized the anterior/posterior drawer and inferior sulcus tests. A comparison of cutaneous and bone-pinned measures of laxity and stiffness revealed good to excellent criterion validity (r=0.68 to 0.79). Examination of displacement measures at increasing levels of force revealed increasing capsular laxity with symmetric directional compliance. No significant difference was observed between anterior and posterior translation (0.4 mm, p=.55), with significant differences between inferior and anterior (4.6 mm, p=.0001) and between inferior and posterior (5.1 mm, p<.0001). A comparison of manual cutaneous to bone-pinned manual and kinetic measures of translation revealed a significant difference between methods (p=.0024) and between directions (p<.0001) with no significant interaction (p=.0948). Estimations of the force required to achieve clinical end-point suggest that greater force is required in the anterior (173 N) direction compared to posterior (123 N) and inferior (121 N). We have developed two new methods to measure glenohumeral joint kinematics and reported new information regarding normal kinematics of the glenohumeral joint.


The purpose of this study was to compare the functional outcomes of patellar tendon and semitendinosus/gracilis autografts to fascia lata allografts. In a long-term retrospective study, 314 of 637 ACL patients of 4 orthopedic surgeons were contacted and tested subjectively; a subset of 53 was tested objectively. Group 1 (N=152) consisted of patellar tendon and semitendinosus/gracilis autografts (PT/ST), and group 2 (N=162) consisted of fascia lata allografts (FLA), with a post-operative mean time of 10.9±1.8 and 8.2±1.8 years respectively. Subjective measurements of all patients included a 0-100 integer rating scale and the Noyes’ Cincinnati Knee Ligament Rating Scale. A sub-group of 53 patients were also tested objectively on the KT-1000 arthrometer, an isokinetic dynamometer, and hopped in 3 functional tests of single, vertical, and triple hops. The means between groups were no different when comparing the results of subjective, strength, ligament laxity, or functional hopping tests. Of the 53 patients who were also tested objectively, group 1 (PT/ST) patients had final outcome ratings of 48% (N=12) good, 32% (N=8) fair, and 20% (N=5) poor versus 21% (N=6) excellent, 54% (N=15) good, 14% (N=4) fair, and 11% (N=3) poor for group 2 (Chi-square = 8.02, p<.05). KT-1000 differences at 134 N were <3 mm in 68% of group 1 versus 89% for group 2 (4 and 7% between 3 and 5 mm; and 28 and 4% > 5 mm, respectively. Chi-square = 6.2, p<.05). Limb symmetry for isokinetic peak torque at 60°/sec was 90% or greater in 69% (N=16) of the PT/ST group and in 89% (N=25) of the FLA group (Chi-square = 3.1, p=.08). Limb symmetry for the horizontal hop, vertical jump, and triple hop was 85% or greater in 83%, 92%, and 91% (N=23, 24, 23, respectively) of the PT/ST subjects and 85%, 84%, and 93% (N=27, 26, 26, respectively) of the FLA group. Fifty-seven% (N=63) of the PT/ST subjects and 58% (N=71) of the FLA patients returned to the highest activity level of jumping, pivoting, and cutting. Twenty-six% (N=29) and 28% (N=34) of the PT/ST and FLA groups, respectively, returned to running, twisting, and turning. Regression analysis of the dependent variables demonstrated no strong associations between a 0-100 subjective integer scale and all other variables. Pain, swelling, stairs, and full giving-way combined were the best predictors (r=0.65), accounting for 43% of the variability of the patients’ perception of final outcome. KT 1000 results were poor predictors of patients’ perceived outcome (r-values less than 0.21).

Wilson, Laura S. Training and thyroid hormone profiles of collegiate, female rowers during fall and winter training, 2000. M.A., University of North Carolina, Chapel Hill (A. C. Hackney). (97pp 1f $5.00) PE 4156

The purpose of this study was to determine if resting fT3 and fT4 levels are influenced by the amount of training performed in collegiate, female rowers over fall and winter training. Seventeen rowers and four control subjects completed four laboratory visits (over 18 weeks, 4-5 weeks apart). The controls exhibited no significant changes in fT3, fT4, or the fT3/fT4 ratio. Within the rowers a group of responders (decreased levels of fT3) and non-responders (no change in fT3) emerged. The responders had significant decreases in FT3, and the fT3/fT4 ratio from visits one to two (no change in fT3) emerged. The responders had significant decreases in FT3, and the fT3/fT4 ratio from visits one to two (p<0.05). In general significantly more training was performed in the fill season (weeks 1-9), than during winter training (weeks 10-20). No significant differences existed in physical characteristics, performance, or training between the responders and non-responders. Free T3 may decrease in rowers, but the response is individualized and not associated with diminished performance.

The determination of the ability of an ankle support system to allow for complete freedom of motion within the active range of motion and limit the mobility of the ankle outside the active range, is an important issue. The participants in this study included varsity baseball players (N=18) from a small college in Western Massachusetts. The ankles of the athletes were used to test the effectiveness of the Swede-O-Ankle Lok® support, Active Ankle T2® support, and athletic tape, compared to that of the control prior to and after a game-like simulated activity. In the direction of inversion pre/post activity all supports exhibited significant (p<.05) differences in average torque to that of the control group. No significant (p>.05) differences existed in the level of support provided by the Swede-O-Ankle Lok® and Active Ankle T2® supports under any condition; although, both provided significantly (p<.05) more support than athletic tape. In the direction of eversion pre/post activity only the Swede-O-Ankle Lok® and Active Ankle T2® supports exhibited significant (p<.05) differences to that of the control group. No significant (p>.05) differences existed in the level of support provided by athletic tape and the control pre/post activity.

PHYSIOLOGY AND EXERCISE EPIDEMIOLOGY

Alexander, Jeffrey L. Validity of a single-stage submaximal treadmill walking test for predicting VO2max in college students, 2000. M.S., Brigham Young University (James D. George). (54pp 1f $5.00) PH 1707

This study had two purposes: (a) to validate a single-stage submaximal treadmill walking test (Ebbeling, Ward, Pulleo, Widrick, & Rippe, 1991) for predicting VO2max of college-age individuals, and (b) to develop a new prediction equation if the Ebbeling et al. equation proved invalid. Volunteers (N=118; females=63, males 55; 20.6±2.3 yr.) successfully completed a submaximal treadmill walking test and a maximal graded exercise test (GXT) on a treadmill. Open circuit calorimetry was used during the GXT to measure VO2max (44.5±6.5 ml·kg·min⁻¹; range=30.88-60.67 ml·kg·min⁻¹). The regression equation developed by Ebbeling et al. grossly overestimated (+8.37 ml·kg·min⁻¹; p<.001) VO2max in this sample of college students. As a result, multiple linear regression was used to generate the following prediction equation using data from the lower-fit (VO2max=41.8±5.0 ml·kg·min⁻¹; range=30.88-49.46 ml·kg·min⁻¹) participants (N=86; R=.84; SEE=2.69 ml·kg·min⁻¹): VO2max=4.952+7.53 x gender (0=female, 1=male)-0.1515 x body mass (kg)+4.051 x walking speed (mph)+0.1054 x exercise heart rate (bpm). Most participants (N=95) performed the submaximal treadmill walking test twice, yielding a test-retest intraclass reliability coefficient (ICC) of .93 for VO2max prediction across days. The reliability of VO2max estimates for females (ICC=.92) was greater than for males (ICC=.82). Cross validation results were also acceptable (R2max=.82, SEE =2.83 ml·kg·min⁻¹) which suggests that the new prediction equation should yield similar accuracy when applied to a similar, but independent, sample of college-age individuals. In summary, the submaximal treadmill walking test developed in this study is a relatively accurate and comfortable means of estimating VO2max in lower-fit college students.


The purpose of this study was to examine the effects of a high-intensity resistance overtraining protocol (characterized by decreased strength performance) on resting levels of free testosterone, cortisol and the free testosterone/cortisol ratio. Sixteen weight trained males were divided into an overtraining group (n=8) that exercised on a squat machine daily for 2 weeks with 100% of 1 repetition maximum (IRM) relative intensity and a control group (n=8) that exercised 1 day per week with low intensity (50% IRM). Test batteries were conducted at the beginning (baseline), after 1 week (test 2) and after 2 weeks (test 3) of the study. The control protocol elicited no changes in resting free testosterone, cortisol, the free testosterone/cortisol ratio, or in IRM performance. The overtraining protocol also elicited no changes in the resting levels of these hormones; however, there were significant declines in IRM performance compared to the control group. The endocrine profile for the overtraining group with high-intensity resistance exercise was considerably different from what has been reported for overtraining with aerobic activities or increased volumes of resistance exercise. In future studies, researchers must take into account that different modes of overtraining may elicit different endocrine responses and thus investigate each mode of overtraining for its individual symptoms.

Campbell, Jennifer A. Metabolic and cardiovascular responses to shallow water exercise in younger and older adult women, 1999. M.S., Central Washington University (Leo D’Acquisto). (74pp 1f $5.00) PH 1716

The purpose of this investigation was to compare the metabolic and cardiovascular responses of women ages 19-24 and 63-72 during shallow water exercise. Eleven active females from each age group participated in this investigation. Testing sessions included: (1) treadmill stress test
DWR maximal exercise capacity, in which case muscular characteristics of water immersion causing ventilation/improvement (+10%). This inability to reach statistical (p>0.05), although there was a definite trend towards water running VO2max did not statistically improve deep water running trail program in elderly women, Chu, Kelly S.

exercise prescription guidelines for enhancing fitness level. which meet the American College of Sports Medicine's exercise class where HR was monitored. In conclusion, shallow water exercise performed by older and younger adults elicits metabolic and cardiovascular responses which the American College of Sports Medicine's exercise prescription guidelines for enhancing fitness level.

Chu, Kelly S. Cardiorespiratory responses following an 8 week deep water running trail program in elderly women, 2000. M.Sc., University of British Columbia (Ted Rhodes). (150pp 2f $10.00) PH 1710

The study compared and contrasted the acute and training responses of deep water running (DWR) to treadmill running (TMR) in elderly women. Twenty inactive, healthy women (64.5±3.5 years) volunteered to participate in this study. Subjects were randomly and evenly divided into a control or exercise group. One subject from the control group withdrew from the study due to medical reasons and another control subject was unable to complete post TMR tests. Maximal TMR exercise response was achieved using a graded protocol of 3.5mph, increasing 2% grade/ min. Maximal DWR exercise response was achieved using a tethered apparatus starting at an initial load of 300g and increasing 100g/min. Training intensities were set at 70%, 75%, and 80% of pre-training DWR maximal heart rates (HR) during weeks 1-2, 3-5, and 6-8, respectively. Maximal oxygen consumption (VO2max), ventilation (VE), heart rate (HR), and respiratory exchange ratio (RER) were measured during DWR and TMR maximal tests, both pre- and post-training. Blood samples were taken 2 minutes post-exercise to determine blood lactate concentrations (Blac). Within subject repeated measures ANOVA was performed to determine whether statistical differences occurred across exercise conditions (TMR vs. DWR), over time (training effect), and with training responses between TMR and DWR (specificity of training). Data obtained pertaining to the acute responses of DWR and TMR revealed significantly higher TMR VO2max (23.94 vs. 18.49 and 21.59 vs. 17.65 ml/kg/min, p<0.05) and HR (164.50 vs. 157.70 and 161.75 vs. 156.13 beats/min, p<0.05) compared to DWR for exercise and control groups, respectively. Training for 8 weeks with DWR increased TMR VE (14%, p<0.05), TMR VO2max (18%, p<0.05), and DWR VE (15%, p<0.05). Deep water running VO2max did not statistically improve (p>0.05), although there was a definite trend towards improvement (+10%). This inability to reach statistical significance in DWR VO2max may be attributable to the characteristics of water immersion causing ventilation/perfusion inequalities and/or the protocol used to assess DWR maximal exercise capacity, in which case muscular strength could have been a limiting factor. While the data obtained in this study did not show improvements in DWR VO2max, improvements in TMR VO2max, TMR VE, and DWR VE indicate that training adaptations do occur with DWR training protocols, irrespective of the lower physiological stress induced with water immersion.

Clay, Dawn E. Comparing kilocaloric expenditure between a stair-stepper, a treadmill, and an elliptical trainer, 2000. M.S., Eastern Washington University (Wendy Repovich). (53pp 1f $5.00) PH 1704

Aerobic exercise has many advantages for people who want to improve their cardiovascular fitness. One specific advantage is that aerobic activity stimulates the expenditure of calories which ultimately could affect weight. The purpose of this study was to determine if differences exist between actual calorie expenditure and the machine generated values for calorie expenditure while performing exercise on a StairMaster 4000PT, a Precor Elliptical EFX544, and a Trotter 640CR Treadmill. The three machines used for this study all require the user to accurately input their weight in order for the computer to generate accurate data about calories expended. Subjects for this study were women between the ages of 18-25. Each subject performed one exercise test on each of the three machines used in this study. After at least five minutes of rest and prior to being tested, a resting heart rate and blood pressure were taken. The testing order was randomly determined using Popsicle sticks. Each subject was weighed prior to each test to determine accurate body weight. A polar heart rate monitor was attached, and the subject was allowed a five minute warm-up on the correct machine with the Aerostop Teem 100 equipment in place to acquaint them with the testing equipment. Following the warm-up, data was collected from a 10-minute submaximal steady state test. Each subject used a “no-hands” technique on each piece of equipment to maintain consistency. To equate workloads between each of the machines used in this study, the heart rate of each subject was required to reach 75% of the HRR using the Karvonen formula. The researcher then made every effort to assure that the heart rate was maintained within four beats throughout the test by encouraging the subjects to maintain the same intensity. A t-test was used to determine the level of significant difference between machine generated and actual calorie expenditure for each of the three machines. The alpha level was set at .05. The results of the t-test showed a significant difference between actual and machine generated calorie expenditure only for the StairMaster, with machine generated calories higher than actual calorie expended. The results of this study may be due to the fact that the StairMaster has a greater number of variables to consider than the Precor Elliptical or the Trotter Treadmill.
for glucose, glycerol and Fat Kcal·min^{-1} were significantly different. Although no significant differences were found for VO_{2peak}, VO_{2-peak}, VO_{2-HR}, VO_{2peak}, VO_{2-HR} and R_{E} were measured using a portable metabolic gas analyzer. Blood lactate was measured post exercise. Outcome variables were analyzed with repeated measures ANOVA. Although directionally similar to previous studies with treadmill exercise and free range running. Fifteen competitive cross country runners (19±2 yr) from the University of Wisconsin-La Crosse performed an incremental treadmill test and an unpaced 1-mile run on an indoor 200 meter track. Physiological variables (VO_{2peak}, HR_{peak}, VO_{2-peak}, VO_{2-HR}, VO_{2peak}, VO_{2-HR}) were measured using a portable metabolic gas analyzer. No meaningful differences were found for Kcal·min^{-1} between conditions. Thus, caffeine ingestion 60 minutes prior to step aerobics increased fat utilization.

Derchak, P. A. Expiratory flow limitation and ventilatory responsiveness interact to determine exercise ventilation, 2000. Ph.D., Indiana University (Joel M. Stager). (183pp 2f $10.00) PH 1698

A significant number of highly trained endurance runners have been observed to display an inadequate hyperventilatory response to intense exercise. Two potential mechanisms include low ventilatory responsiveness to hypoxia or mechanical constraint of ventilation as indicated by overlap between tidal and maximal flow-volume loops. Two studies were completed to elucidate the relationship among ventilatory responsiveness, expiratory flow-limitation, and ventilation during exercise. Study one tested the hypothesis that expiratory flow limitation can complicate determination of ventilatory responsiveness during exercise. Six elite male runners were categorized based on expiratory flow limitation observed in flow volume loops collected during the final minute of progressive exercise to exhaustion. Eight flow limited (FL) (VO_{2peak}, VO_{2-peak}, VO_{2-HR}, VO_{2peak}, VO_{2-HR}, VO_{2peak}, VO_{2-HR}) and eight non-flow limited subjects (NFL) (VO_{2peak}, VO_{2-peak}, VO_{2-HR}, VO_{2peak}, VO_{2-HR}, VO_{2peak}, VO_{2-HR}) were tested for hypoxic ventilatory responsiveness (HVR). Independent groups ANOVA revealed no significant differences between FL and NFL for VO_{2peak}, VO_{2-peak}, VO_{2-HR}, VO_{2peak}, VO_{2-HR}, VO_{2peak}, VO_{2-HR}, and VO_{2-peak}, VO_{2-HR} (r = 0.92, p ≤ 0.001) in NFL that was not present in FL. Conversely, a significant relationship between V_{E}/VO_{2} and S_{O2} (r=0.79, D=0.019) was observed in FL but not NFL. Regression analysis indicated that the HVR S_{O2} and S_{O2}-V_{E}/VO_{2} relationships differed between groups. These results demonstrate that, when flow limitation is controlled for, HVR plays a more significant role in determining S_{O2} in highly trained athletes than has been previously suggested. Study two extended the results of the first study. Twenty-three highly trained runners completed a progressive incremental test to exhaustion with flow-volume loops, HVR, and a test of hypercapnic ventilatory response (HCVR). Analyses were conducted based upon degree of flow limitation, HVR, and HCVR. FL vs. NFL: six FL and six NFL subjects were identified by cluster analysis (48.0±16.6 vs. 56.3±4.0% limited; VO_{2} max 72.6±3.4; 71.6±3.4 ml·kg^{-1}·min^{-1}). FL and NFL did not differ in VO_{2} max, VO_{2} or S_{O2} during intense exercise. FL were older (23.7±4.1 vs. 19.5±1.2 yrs.), demonstrated higher peak expiratory flow (10.6±1.0 vs. 9.4±1.0 l·sec^{-1}), and higher HCVR scores (1.56±0.35 vs. 0.92±0.62 l·min^{-1}·mmHg^{-1}). Also, FL demonstrated larger IRV (1.0±0.2 vs. 0.6±0.21) during intense exercise and ventilated at a smaller percent-
L-carnitine supplementation and the lactate/pyruvate ratio, 2000. M.S., Springfield College (Samuel A. Headley). (118pp 2f $10.00) PH 1709

The current investigation was designed to determine the effect of exercise with and without ultrafiltration (UF), on blood volume during a dialysis treatment. Subjects were from the Pioneer Valley Dialysis Center (N=10). Subjects were assigned to both of the following treatment conditions in random order: (a) exercise 20-min submaximally with constant ultrafiltration during their prescribed dialysis session; and (b) exercise 20-min submaximally without ultrafiltration during their prescribed dialysis session. The subjects were tested after a 3-week aerobic training program on midweek treatment days, either Wednesday or Thursday. The subjects were tested under both conditions with one week between testing sessions. Four 10-min time intervals were measured: two baselines (min 15-25, min 30-40) and two exercise (40-50 min, 50-60 min). No treatment (UF on versus UF off) by time interaction was found for the percent change in blood volume. Furthermore, no significant main effect was found for time or treatment (UF on versus UF off) on percent change in blood volume (p>.05) based on a 2 x 4 ANOVA with repeated measures. Exercise during dialysis has no effect on percent blood volume with or without UF occurring during the dialysis treatment.

Hunte, Garth S. Endothelial selectins and pulmonary gas exchange in female aerobic athletes, 2000. M.Sc., University of British Columbia (Donald C. McKenzie). (156pp 2f $10.00) PH 1712

Demonstration of a greater elevation in the (ideal) alveolar/arterial oxygen difference in habitually active female subjects with exercise-induced arterial hypoxemia, at equivalent submaximal levels of oxygen uptake compared to inactive controls, suggests functional or structural compromise of the blood-gas interface may occur with chronic-recurrent intensive exercise. Mechanical and/or chemically mediated pulmonary endothelial dysfunction during heavy exercise may alter vascular tone and permeability, leading to interstitial edema and accentuation of
ventilation-perfusion mismatch and/or diffusion limitation. Elevated plasma levels of soluble endothelial cell adhesion molecules E- and P-selectin have been demonstrated in acute lung injury and have been used as indirect markers of endothelial activation or injury. Therefore, plasma levels of these selectins were measured by enzyme immunoassay in fourteen habitually active, eumenorrheic female subjects (mean±SD: age=28.9±5.51; VO2peak=49.4±8.2 ml·kg⁻¹·min⁻¹; range 32.3 to 63.7 ml·kg⁻¹·min⁻¹; TLC=5.41±0.68 L, 101±9.3% predicted) before and after an incremental maximal exercise test during the follicular phase of their menstrual cycle (cycle day=6.2±1.2, serum progesterone=80±100 pmol/L). Arterial partial pressure of oxygen (PAO₂) was measured and corrected for esophageal temperature, arterial oxyhemoglobin saturation (%SaO₂) was calculated from blood gas variables and measured with pulse oximetry, and the (ideal) alveolar/arterial oxygen gradient was calculated from the ideal gas equation. Pulmonary gas exchange efficiency was maintained at peak exercise in ten subjects, while decrements in arterial partial pressure of oxygen during exercise of greater than 1.3 kilopascals (10 mmHg) were seen in three of the remaining four subjects. One subject displayed a minimal %SaO₂ of 94% and was included in the mild hypoxemia group. Maximum likelihood ANOVA procedures, used on account of missing data, showed significant differences between groups averaged over time for PaO₂ (p<0.01) and %SaO₂ (p<0.04), while the group by time interaction for the (ideal) A-aDO₂ approached significance (p=0.07). Averaged over time, changes in alveolar PO₂, arterial PCO₂, pH and temperature were not significantly different between groups. Plasma concentrations of soluble E-selectin were not significantly different before or after exercise (p=0.16), but plasma concentrations of P-selectin rose significantly (mean increase ±SD: 21.5±24.8 ng·mL⁻¹, p=0.007). No significant group by time interaction was noted in pre-post exercise concentrations of either E-selectin (p=0.74) or P-selectin (p=0.42) between subjects who demonstrated normal gas exchange and subjects who displayed mild to moderate exercise-induced gas exchange impairment. The correlation between absolute (ng·mL⁻¹) and relative (%) change in soluble E- and P-selectin, and VO2peak, maximal A-aDO₂ and PaCO₂ was not significant, nor was the correlation between minimal exercise PaO₂ and either absolute (r=0.16, p=0.61) or relative (r=0.18, p=0.57) change in soluble E-selectin. However, absolute change in plasma concentration of soluble P-selectin was significantly correlated with minimal PaO₂ (r=0.60, p=0.04), while the correlation between the relative change in P-selectin and minimal PaO₂ approached significance (r=0.46, p=0.14). The increase in plasma P-selectin induced by heavy exercise may represent platelet and/or endothelial activation. Correlation with impairment of arterial oxygenation is compatible with the hypothesis that pulmonary endothelial dysfunction may occur during intense exercise in some habitually active female subjects.

Kukwuchi, Wendee E. Selection of exercise intensity using perceptual cues during television distraction, 2000. M.S., University of Nevada, Las Vegas (John A. Mercer and Lawrence A. Golding). (147pp 2f $10.00) PH 1721

The selection of exercise intensity during television distraction was studied in 20 highly fit males (VO2peak: 63.2+10.7 ml·kg⁻¹·min⁻¹) between the ages of 28 and 45 years. It was hypothesized that the perception of exercise intensity during cardiovascular exercise would be influenced by an environmental distraction, such as watching television (TV). A within-subjects design was used to compare heart rate (HR), stride frequency (SF), and MET level responses recorded during 15 minutes of exercise performed with and without distraction. Seventeen of the 20 subjects had a change in HR of greater than 5 bpm between conditions, with 9 subjects decreasing HR by 10±4.9 bpm and 8 subjects increasing HR by 9±2.3 bpm during the television distraction condition. The direction of response to treatment was not explained by fitness level or subject age, height or weight. It is conjectured that subjects who reported a preference for exercising with TV distraction increased HR and MET level compared to subjects who stated a preference for exercising without TV distraction.

Larsen, Gary E. Combining walking, jogging, and running into a single VO2max prediction test, 2000. M.S., Brigham Young University (James D. George). (67pp 1f $5.00) PH 1706

The purpose of this study was to develop a submaximal, 1.5-mile endurance test for college-aged students using walking, jogging or running exercise. College students [N=101 (men=52; women=47)], aged 18 to 26 yr, volunteered to participate. Each participant completed the 1.5-mile test twice, and a maximal graded exercise test. Participants were instructed to achieve a “somewhat hard” exercise intensity (rating of perceived exertion = 13) and maintain a steady pace throughout each 1.5-mile test. Multiple linear regression generated the following prediction equation: VO2max = 65.404+7.707 · gender (1=male; 0= female) - 0.159 · body mass (kg) - 0.843 · elapsed exercise time (min; walking, jogging, or running). This equation shows acceptable validity (R=0.86, SEE=3.37 ml·kg⁻¹·min⁻¹) similar to the accuracy of comparable field tests, and reliability (ICC=0.93) is also comparable to similar models. The statistical shrinkage is minimal (R²press=0.85, SEEpress=3.51 ml·kg⁻¹·min⁻¹), hence it should provide comparable results when applied to other similar samples. A regression model (R=0.90, and SEE=2.87 ml·kg⁻¹·min⁻¹) including exercise heart rate was also developed: VO2max = 100.16 + 7.301 · gender (1 = male; 0 = female) - 0.164 · body mass (kg) - 1.273 · elapsed exercise time - .01563 · exercise heart rate, for those who have access to electronic heart rate monitors. This submaximal 1.5-mile test accurately predicts maximal oxygen uptake (VO2max) without measuring heart rate, and is similar to the 1.5-mile run in that it allows for mass
testing and requires only a flat, measured distance and a stopwatch. Further, it can accommodate a wide range of fitness levels (from walkers to runners).

Littrell, Tanya R. *Behavioral determinants of insulin resistance in non-diabetic patients with coronary artery disease*, 2000. M.S., Oregon State University (Daniel P. Williams). (83pp 1f $5.00) PH 1701

Greater degrees of insulin resistance are associated with increased rates of coronary artery disease (CAD) progression. However, the specific behavioral determinants of insulin resistance are not well known in patients with CAD. Although abdominal obesity contributes to insulin resistance, the extent to which abdominal obesity may modify the relationship between health behaviors and insulin resistance is unclear in coronary patients. Thus, the aims of this study are to determine whether selected health behaviors (physical activity, dietary patterns, and psychosocial indexes) are associated with insulin resistance and whether the associations differ between those with and those without abdominal obesity in 26 non-diabetic patients (19 men and 7 women, aged 43-82 years) with CAD after physician referral yet prior to participation in a cardiac rehabilitation program. Greater degrees of insulin resistance were quantified as higher areas under the insulin response curve over a 75g 2-hour oral glucose tolerance test. The Stanford Physical Activity Recall and the Ainsworth Compendium of Physical Activities were used to estimate physical activity energy expenditures. The Block 95 Food Frequency Questionnaire was used to estimate nutrient and vitamin intakes from foods. The Center for Epidemiologic Studies Depression Scale was used to quantify symptoms of depression, and the Cook-Medley Questionnaire was used to quantify feelings of hostility. Abdominal obesity was defined by gender-specific National Institutes of Health criteria (waist circumference ≥102 cm for men and ≥88 cm for women). The patients with abdominal obesity (N=14) had a higher insulin response (Insulin AUC) to the oral glucose load (r=0.020), weighed more (p<0.001), and reported lower physical activity energy expenditures (p=0.017), and lower dietary fat intakes (p=0.041) than the patients without abdominal obesity. Taken together, the similar self-reported energy intakes and lower physical activity energy expenditures are suggestive of a more positive energy balance in the patients with abdominal obesity. Higher insulin AUC values were associated with heavier body weights (r=0.57, p=0.002), lower dietary vegetable intakes (r=0.45, p=0.023), lower dietary (i.e., from foods rather than supplements) vitamin C (r=0.40, p=0.027) and vitamin E (r=0.43, p=0.044) intakes, and higher depression scores (r=0.47, p=0.016). After adjusting for abdominal obesity, higher insulin AUC remained associated with heavier body weights (partial r=0.43, p=0.034), lower dietary vegetable intakes (partial r=0.51, p=0.011), and lower dietary vitamin C (partial r=0.48, p=0.019) and vitamin E (partial r=-0.54, p=0.007) intakes. Insulin AUC was independently associated (p≤0.039) with the interactions of body weight, dietary vegetable intake, and dietary vitamin E intake with abdominal obesity, indicating a stronger association between insulin resistance and these health behaviors in patients with, versus those without, abdominal obesity. We conclude that higher self-reported depression scores, lower dietary vegetable, fruit and vitamin E intakes, and lower physical activity levels may be important behaviors to identify for better managing insulin resistance and abdominal obesity in non-diabetic patients with CAD who are referred to cardiac rehabilitation.

Martin, Bryant R. *The effects of creatine on handgrip dynamometer maximal contraction and submaximal endurance contraction*, 2000. M.S., Brigham Young University (Mark Ricard). (56pp 1f $5.00) PH 1700

This study evaluated the effects of oral creatine supplementation on high- and low-intensity handgrip performance. Sixteen healthy United States Army Rangers (all males, average age=25.4) were randomly assigned to a creatine treatment (CT) group or a placebo control (PC) group. The creatine treatment group consumed 24g of creatine monohydrate (Cr) for six days followed by 89 days of 6g/day. The placebo control group followed the same supplementation schedule but were given an isocaloric supplement. Measurements were made the day before the load phase (T1), the seventh day of the load phase (T2), three weeks into the maintenance phase (T3), and at the conclusion of the maintenance phase (T4). Measurements included three maximal voluntary contractions (MVC), separated by a one-minute rest, and one submaximal endurance contraction (SEC) determined to be 50% of average MVC, given two minutes after the last MVC. Fourteen subjects were included in the data analysis, eight subjects in the creatine treatment group and six in placebo control (two subjects were dropped due to injury). Three variables were analyzed: MVC, duration of SEC, and a calculated integral based on pounds per square inch times seconds (INT). Independent and paired T-tests were used to compare the data. No significant difference between groups was found in any of the variables (p>0.05). The results of this investigation indicate that neither creatine supplementation taken in high doses (24 grams/day) as a loading phase nor creatine taken in small doses (6 grams/day) as a maintenance phase had any significant impact on handgrip dynamometer performance.

Melton, Jeremy C. *The effects of ribose supplementation on anaerobic exercise performance and markers of anaerobic metabolism*, 2000. M.S., University of Memphis (Richard B. Kreider). (56pp 1f $5.00) PH 1719

The interaction between ribose supplementation and anaerobic exercise performance and physiological markers of anaerobic exercise was investigated in (n=19) healthy,
trained males. Participants performed baseline testing that included body water/composition testing (BIA), a 3-site skinfold measurement, a finger stick blood sample, and two 30-s Wingate cycle sprint tests separated by 3-min of passive recovery. Blood samples were taken before, during, and after the exercise testing and analyzed for lactate, ammonia, glucose, and uric acid. Participants were then matched and paired, based on age, body mass, and power output, then randomly assigned to one of two groups: dextrose placebo or D-Ribose. Subjects ingested 5g of the assigned supplement twice daily for 5-d (50-g total). Post-testing, identical to pre-testing, was performed the day after supplementation was completed. Statistical analysis revealed a significant interaction (p<0.04) in total work output on the second sprint of post-testing, in which the ribose groups maintained total work output better than the placebo group. No significant differences were found between the groups on peak power, average power, torque, or fatigue index. No significant interaction effects were found between the means for any of the serum markers. Trends were found that suggest further research is needed to investigate ribose supplementation, due to the possibility of some ergogenic benefits.

Minson, Christopher T. Loading effects of phosphate on 2,3-DPG and aerobic capacity. 1993. M.A., San Diego State University (Anthony Sucec). (82pp If $5.00) PH 1722

The purpose of this investigation was to find the effects, if any, of orally loading with different amounts of sodium phosphate for 3 days on selected blood parameters and aerobic performance, defined as a maximal treadmill oxygen consumption test (VO2 max). Twelve highly trained male endurance runners participated in the study. Each subject was required to ingest capsules containing either a placebo (white flour and sugar mixture) or one of three dosages of phosphate for 3 days prior to a VO2 max test. The three dosages of phosphate were as follows: low dose=20mg/kg lean body mass (LBM); medium dose=50mg/kg LBM; high dose=80mg/kg LBM. Each subject was required to perform all the tests in a double-blind crossover fashion. The average amount of sodium phosphate ingested over the 3 days (gm±SEM) for each of the tests is as follows: low dose=1.38±0.4; medium dose=3.44±0.9; high dose=5.5±1.4. Immediately prior to and at the completion of each of the VO2 max tests a blood sample was taken and frozen for later analysis. The bloods were measured spectrophotometrically for pre- and post-exercise red blood cell (RBC) 2,3-DPG and serum phosphate concentrations. Results were tested for significance using an ANOVA for repeated measures. Mean (±SEM) VO2 max values for the placebo, low dose, medium dose, and high dose conditions were 74.1±1.34, 76.6±1.47, 75.3±1.44, and 74.3±1.51, respectively. A Tukey post-hoc analysis revealed significant differences (p<0.05) between the placebo and low dose, and between the low and high doses. Based on the means of the VO2 max tests, there was an inverted “U” shape with the placebo and high dose being associated with the lowest means, and the low and medium doses being associated with the highest means. There were no significant differences found for any measured blood variables, although the means also followed a pattern similar to that observed in the VO2 max measurements (inverted “U” shape). There were no significant correlations between the blood measures and VO2 max. It was concluded that there is a dose-related increase in performance with phosphate ingestion, and that the most effective dose of sodium phosphate lies between 20 and 50 mg/kg LBM. Since this increase in performance occurred without a change in any of the measured blood parameters, the supposition that there is a peripheral effect of phosphate on oxygen extraction independent of the traditional modifiers of the oxygen dissociation curve is supported.


The purpose of this series of experiments was to examine the mechanisms which underlie the control of blood pressure in young and older men during exposure to different cardiovascular stresses. Of particular interest was how advanced age may alter the interaction between central cardiac and peripheral hemodynamic responses when maintenance of blood pressure is challenged. In the first study, young and older subjects (23±1 vs. 70±3 years old; p<0.05) were passively heated to their limit of thermal tolerance with water perfused suits. At the limit of thermal tolerance, a significantly lower forearm blood flow (FBF) in the older men (32±3 vs. 19±2 ml·100 ml⁻¹·min⁻¹; p<0.05) was associated with a significantly lower cardiac output (Qc) (10.9±0.6 vs. 7.4±0.6 L·min⁻¹; p<0.05). The older men also redistributed less blood flow from their splanchnic and renal circulations (960±80 vs. 720±100 ml/min; p<0.05). The lower Qc and less redistributed flow from the visceral circulation contributed to the significantly lower increase in skin blood flow (SkBF) in the older compared to the young men (5.8±0.7 vs. 2.7±0.3 L/min; p<0.05). In addition, the cardiac responses to passive heat stress were altered as an effect of chronological age, with the older men relying on a greater proportion of their chronotropic reserve (62±3% vs. 75±4% of maximal heart rate [HRmax]; p<0.05) to compensate for a reduced inotropic response. In the second study, the hemodynamic responses to upright tilt were compared in young and older men (23±1 vs. 70±3 years old; p<0.05) in thermoneutral and passively heated conditions. The older men relied on a greater increase in splanchnic vascular resistance (SVR) (∆32±10 vs. ∆52±8 units during the heated tilt; p<0.05) to compensate for a reduced ability to increase muscle and skin vascular resistance, as determined by FBF (Δ12±4 vs. 43±3 units during the heated tilt; p<0.05). The added stress of a high mean skin temperature (Tskmeas) during tilting caused a
higher incidence of orthostatic intolerance in the young men. The third study was designed to measure Qc, stroke volume (SV), and heart rate (HR) in endurance trained older, and more sedentary young men (26±1 vs. 65+/− years old; p<0.05) matched for peak oxygen consumption (VO2peak) and anthropometric variables during submaximal cycle exercise in thermoneutral and warm environments. The older men had a lower Qc relative to younger men at intensities greater than 60% (23.3±0.6 vs. 20.4±0.4 L·min−1 at 85% VO2peak; p<0.05). The older men relied on a greater SV (138±8 vs. 121±6 mL·beat−1; p<0.05) to increase Qc. It appears that endurance trained older men can enhance left-ventricular performance to augment SV, but not sufficiently to maintain Qc in light of an attenuated HR response during exercise at intensities above 60% VO2peak. Based on the results from these experiments, control of blood pressure is well maintained in healthy older men; however, the mechanisms by which blood pressure is maintained is altered. In addition, central cardiovascular changes that occur with advanced age may limit the cardiac responses to stress.

Nuzzo, Jason M. The reliability and validity of transcutaneous PCO2 monitoring as a non-invasive tool for the assessment of the anaerobic threshold, 2000. M.S., University of North Carolina, Chapel Hill (Cathryn R. Dooly). (79pp 1f $5.00) PH 1715

The purpose of this study was to determine the reliability and validity of tPco2 monitoring (tPco2) as a non-invasive tool for the assessment of the anaerobic threshold. The study compared tPco2, against blood lactate (LT) and ventilatory thresholds (VT). Subjects for this study were 15 college women ranging in age from 18-25 and were required to have a VO2max between 35-60 mL/kg/min. Subjects performed identical discontinuous maximal bicycle ergometer exercise tests on two nonconsecutive days. Blood samples were collected and analyzed for lactate concentration by a blood lactate analyzer. Ventilatory parameters were collected by the SensorMedics Metabolic Cart. A tPco2 monitor determined the partial pressure of carbon dioxide. A Pearson product correlation comparing three methods indicated that tPco2 is not a valid method. A strong negative relationship existed between LT and VT (r=-.7956). A very weak negative relationship resulted between tPco2 and LT (r=-.0936) and tPco2 and VT (r=-.0249). An additional correlation revealed that tPco2 produced a moderate positive relationship (r=.4237) between test day one and test day two. A two-tailed t-test performed on tPco2 indicated that this method is reliable and could produce the same results over two testing days (t=.66). A one-way ANOVA indicated reliability between the means of the three methods (F=2.80).


The study was designed to assess the acute effects of placebo, caffeine, ephedrine, and the combination of caffeine and ephedrine on strength, power, and quickness. Using a repeated measures, double-blind design, 10 male subjects (21.90±1.73 years) performed maximal knee extension using the CYBEX NORM (Cybex International, Ronkonkoma, NY) as a measure of strength; power was measured by the height (cm) of a vertical jump; quickness was measured as the time taken to complete a 40m maximal shuttle run. Subjects performed the exercise tests 75 minutes after ingestion of either placebo, caffeine (5mg·kg−1), ephedrine (1mg·kg−1), or caffeine + ephedrine. The mean peak torque scores and total work scores for the combination of caffeine and ephedrine condition were significantly (p<.05) higher compared to the placebo condition. The average shuttle run means for the caffeine + ephedrine condition and the ephedrine condition were significantly (p<.05) lower than the placebo condition. All other pairwise comparisons were not significantly (p>.05) different. In conclusion, the combination of caffeine + ephedrine treatment improved strength and quickness compared to placebo, and ephedrine improved quickness compared to placebo.

Shafer, Natalie N. Relationship between the talk test and ventilatory threshold, 2000. M.S., University of Wisconsin, La Crosse (Carl Foster). (52pp 1f $5.00) PH 1705

Previous studies with healthy, physically active individuals have demonstrated that the ventilatory threshold (VT) is closely associated with the highest exercise intensity at which subjects may speak comfortably, the Talk Test (TT). However, public health recommendations regarding the utility of the TT for exercise prescription are usually made for sedentary populations. In this study, the relationship between the VT and TT in healthy, sedentary individuals was evaluated. Subjects (N=10) performed incremental treadmill exercise with gas exchange to define VT. In random order, they also repeated the exercise test and provided speech samples using either the Rainbow Passage (RP), 101-words, or the Pledge of Allegiance (PA), 31-words. The VO2 at VT was 18.0±3.2 mL·min−1·kg−1. During the last stage with comfortable speech (positive) the VO2 was 20.6±1.6 (RP) and 22.2±4.8 (PA) mL·min−1·kg−1. At the equivocal stage (positive/negative) of the TT, the VO2 was 22.6±1.4 (RP) and 24.8±6.0 (PA) mL·min−1·kg−1. The negative stage of the TT, the VO2 was 26.2±1.6 (RP) and 27.3±2.7 (PA) mL·min−1·kg−1. All comparisons were significantly greater than the VO2 at VT. There were no significant differences between the RP and PA. At VT, the %HRmax was 74±2, at positive 78±3% (RP) and 80±3% (PA), at equivocal 86±3 (RP) and 86±2% (PA), and at negative 93±2 (RP) and 95±2% (PA). The results are somewhat at variance with the previous results, in that VT was passed before the ability to talk comfortably disappeared. However, the positive stage of the TT was still within ACSM guidelines, both for % VO2max and
The purpose of this study was to investigate the difference in single session strength performance with and without a prior 25-minute cardiovascular cycling session. The investigation included 20 male students between the ages of 18 and 30 from the Butler County Community College. Total repetitions for three sets of six strength exercises were compared with and without a prior 25-minute cardiovascular cycling session. Within the limitations of the study the following conclusions appear warranted. The results indicated that for overall strength performance, cardiovascular training had no effect on total repetitions. Furthermore, no difference in strength performance was found for upper body, lower body, bench press, shoulder press, leg flexion, triceps extensions, and calf raises. However, cardiovascular cycle exercise caused a significant decrease in leg extension strength performance.

Stefl, David P. *Creatine does not enhance strength development in male college students during a 10-week weight lifting program*, 1999. M.S., Brigham Young University (Kenneth L. Knight). (66pp 1f $5.00) PH 1703

The objective of this study was to test the effects of creatine measures on one factor. The independent variables included a liquid supplement (placebo or creatine) and time (pre-, mid-, and post-test). Training weight, 1 repetition maximum (1RM), and Dynamic Strength were measured as dependent variables. Forty-two male college students from 3 beginning weight-training classes were the subjects. We pre-tested, weight trained 3 days per week for 5 weeks, mid-tested, weight trained 3 days per week for 5 more weeks, and post-tested. We tested subjects’ leg press 1RM strength and Dynamic Strength (the number of times they could lift 160% of their pre-test body weight). Body weight was recorded each week. Both groups increased significantly in strength: training weights increased approximately 100%, 1RM increased 45%, and Dynamic Strength increased in excess of 300%. There were, however, no differences between groups for Training weights, 1RM, or Dynamic Strength. The creatine group gained weight (2.6%, t(20)=4.9, p=.001), while the placebo group essentially stayed the same (-.01%, t(18)=-.37, p=.72) during the training program. The difference between groups was significant (t(40)=3.1, p=.003). There was little to no correlation between strength measures: for 1RM vs. Dynamic Strength, r=.13; for 1RM vs. training weights, r=.44; for Dynamic Strength vs. training weights, r=.29. Our conclusion is that creatine does not appear to enhance leg press strength development in male college students during a 10-week weight training program associated with beginning weight training classes.

Snyder, Robert. *The effect of prior aerobic exercise upon single session strength performance*, 1999. M.S., Slippery Rock University (Gary Pechar). (55pp 1f $5.00) PH 1696

The effects observed for IL-6, IL1-β, and TNF-α production in LPS-stimulated whole blood cultures after exercise. A significant time effect (F=11.23, p=0.029) was observed for IL-1 β production when expressed per monocyte. A single bout of moderate-to-high intensity resistance exercise had no effect on cytokine production in LPS-stimulated whole blood cultures in postmenopausal women aged 65-79.

Washington, Sara B. *Energy expenditure and substrate utilization in non-obese African American and Caucasian women*, 2000. M.S., Purdue University (Darlene A. Sedlock). (56pp 1f $5.00) PH 1720

The purpose of this study was to examine energy expenditure and substrate utilization at rest and during submaximal exercise in non-obese physically active African American (PAA) (n=8), non-obese sedentary African American (SA) (n=9), and non-obese sedentary Caucasian women (SC) (n=8) ages 19-34 yrs who had a family history of obesity. All subjects completed a 45 min resting session followed by a 25 min submaximal treadmill exercise (60-65% VO2max). Energy expenditure and substrate utilization were measured during both testing sessions. Data were analyzed using one way analysis of variance. Tukey post hoc analysis was used to identify any significant differences. PAA had significantly higher VO2max (39.5±4.8 ml/kg/min) than SA (31.2±4.2 ml/kg/min), but no difference was found compared to SC (35.3±4.2 ml/kg/min). Results revealed no significant differences in resting metabolic rate after adjusting for fat free mass. No significant differences were found for carbohydrate or fat oxidation at rest or
during submaximal exercise when expressed as percentage of total energy expenditure. These findings do not support hypotheses attributing low fat oxidation and low resting metabolic rate to the high rate of obesity among African American women.

Watanabe, Kaori. *Effects of leukocytes on equine satellite cell proliferation*, 2000. M.S., Washington State University (Sally E. Blank). (82pp 1f $5.00) PH 1724

Satellite cells (SC) in normal skeletal muscle can become quiescent after the postnatal growth period. However, SC can be activated and may re-enter the cell cycle with increased functional load, such as prolonged stretch or exercise. One of the earliest cellular events for the repair of skeletal muscle is the accumulation of leukocytes. Extrinsic factors released from monocytes/macrophages have been shown to induce SC proliferation *in vitro*. The effects of other types of leukocytes on SC proliferation have not been thoroughly investigated. This study was designed to compare extrinsic regulation of *in vitro* SC proliferation by selected isolated leukocyte subpopulations and by total leukocyte populations. Cloned equine SC (SE-2) were incubated, for 144 h, with conditioned media (CM) obtained from selected subpopulations of equine peripheral blood leukocyte cultures (monocytes, polymorphonuclear leukocytes (PMN), lymphocytes, or total leukocytes). Compared with control values, significant proliferative effects were observed in cells cultured with CM from total leukocytes (p<0.01) and from PMN (p<0.05). Total leukocytes were stimulated, for 144 h, with interferon-gamma (IFNγ, 300U/ml), interleukin-2 (IL-2, 500U/ml), lipopolysaccharide (LPS, 1µg/ml), 0.8 µm latex beads (LB, 0.1%), or *Staphylococcus aureus* (SA, 0.1%). SC were incubated with CM from these cultures. Significant proliferative effects (p<0.05) were observed in cells cultured with CM from IFNγ- or LB-stimulated leukocytes compared with control values. SC were then co-cultured in transwell plates with total leukocytes. Leukocytes were stimulated while in co-culture with SC. The SC and leukocytes were separated by a membrane (0.4 µm pore size) which eliminated juxtacrine effects (cell-cell interaction) but allowed free diffusion of extrinsic factors, such as cytokines, between the upper and lower chambers. A trend (p=0.07) for increased SC proliferation was observed in co-cultures stimulated with IFNγ, whereas, other co-culture conditions did not induce significant SC proliferation. These results indicated that equine SC have augmented *in vitro* proliferative responses when incubated with extrinsic factors released from IFNγ-stimulated total leukocytes.

Wolff, Gaby M. *The relationship of the Borg rate of perceived exertion (RPE) scale and Borg category-ratio scale (CR-10) to mechanical and physiological intensity of untethered freestyle swimming in trained swimmers*, 2000. M.S.Ed., Northern Illinois University (Sharon Ann Plowman). (165pp 2f $10.00) PH 1702

One group of Division I collegiate swimmers (M=9, F=7) established intraclass reliability for Borg’s RPE scale at R=.94. A second group (M=9, F=6) established intraclass reliability for the CR-10 scale at R=.95. A third group (M=10, F=7) revealed (by t-test analysis) that Borg’s transformation scale between RPE and CR-10 was acceptable for high intensity, but not low intensity, freestyle swimming. Concurrent validity for the RPE and CR-10 was established against HR (r=.73; r=.62) and velocity (r=.62; r=.66). Using raw data rectilinear relationships were found between RPE and velocity, power, HR, and between CR-10 and velocity, HR and BLC. The relationship between RPE and BLC was a negatively accelerating curve. The relationship between CR-10 and power was a positively accelerating curve. Using geometric means, rectilinear relationships were found between RPE and velocity, power and HR, and between CR-10 and velocity, power and HR. Curvilinear relationships were found between RPE and BLC (negatively accelerating), and CR-10 scale and BLC (positively accelerating). It is suggested that either one or the other scale can be used in practice for trained swimmers.

Woolstenhulme, Mandy. *Effects of same-day strength training on selected physiological variables in female collegiate basketball players*, 2000. M.S., Brigham Young University (Philip E. Allsen). (56pp 1f $5.00) PH 1699

The purpose of this study was to determine the same-day effects of strength training on vertical jump, anaerobic power, and VO₂max values in 18 female collegiate basketball players (age 18-22 years). Performance variables were measured approximately six hours following a morning lifting routine, identified as a lift day (LD), and were compared to assessments on a no-lift day (NLD). Dependent t-tests revealed no significant differences between LD and NLD for any of the performance variables. The mean difference in VO₂max between LD and NLD was 0.76 ml/kg/min (48.5 ml/kg·min⁻¹ and 49.3 ml/kg·min⁻¹, respectively) [t(17).64, p=.53]. The mean difference between LD and NLD for a two-legged vertical jump was 0.17 inches (19.3 in and 19.5 in, respectively) [t(17).96, p=.35]. Relative mean power, as measured using a Wingate bicycle test, had a mean difference between LD and NLD of 0.15 watts/kg (6.4 watts/kg and 6.6 watts/kg, respectively) [t(17).83, p=.42]. These data suggest that collegiate female basketball players may lift weights on game days with no significant effect on VO₂max, vertical jump, and anaerobic power.

Wright, Susan K. *The effect of bench height on heart rate of college-age women of short and tall stature*, 1999. M.S., Slippery Rock University (Robert W. Arnhold). (72pp 1f $5.00) PH 1697

The purpose of this study was to determine if there was a significant difference in heart rates of college-age women of short vs. tall stature when performing the Astrand-Ryhming Step Test at three different bench heights. The
investigation included a total of 60 women subjects who were currently enrolled in the Personal Physical Fitness classes. Two groups consisting of 30 short stature and 30 tall stature subjects were tested. Ten subjects from each group tested on the 12, 14, and 16-inch benches. A two-way ANOVA was utilized to analyze post exercise mean heart rates between the two statures, among the three different bench heights, and for an interaction between stature and bench height. Data was analyzed at the .05 level of significance. Significant differences were observed between mean heart rates and among the three different bench heights, but not between stature and bench height.

**HEALTH AND HEALTH EDUCATION**

Baker, Kathy. *Reimbursement of occupational therapy and physical therapy in hand rehabilitation*, 2000. M.S., University of Nebraska, Omaha (Richard Stacy). (30pp 1f $5.00) HE 683

In the past, reimbursement of hand therapy has been greater if provided by a physical therapist than an occupational therapist. While this has been observed in the clinical setting, no formal studies have shown this. The object of this study was to see if this is occurring. One hundred and sixty insurance companies in Omaha, Nebraska, were surveyed regarding reimbursement of therapy, but only 10 usable questionnaires were returned. Data from returned surveys were analyzed. Results indicate that insurance companies are reluctant to respond to such a survey. Of those that did respond, occupational therapy is being reimbursed but not as often as physical therapy. This study demonstrates the need to further educate insurance companies on the services provided by occupational therapists and a need to find a more reliable method of gathering data of this nature. General statements about the limited findings are presented.

Berg, Christina M. *Myopia education 101: a holistic journey to understanding myopia development, natural improvement, and prevention strategies*, 2000. M.P.H., University of Wisconsin, La Crosse (Richard Detert). (130pp 2f $10.00) HE 673

The conventional way of rectifying the myopic state is for optometrists to prescribe corrective lenses (contacts or glasses) that assist a person to see clearly at a distance. More recently, some of these professionals are opting to provide laser refractive surgery to correct the myopia of their clients. The purpose of this graduate project was to provide a synthesis of the literature concerning lifestyle and environmental factors that can influence myopia development. Natural, noninvasive strategies for myopia improvement and prevention were also summarized. A manual was created for the lay individual and health care professionals to facilitate understanding of this information. This manual was also designed to serve as a comprehensive reference for professionals interested in formulating research questions relating to natural myopia improvement and prevention. Background information was included in the manual regarding human vision development and function, testing procedures for refractive error, optometric prescription reading tips, and conventional ways of correcting myopia. Case examples of individuals who have improved and cured their myopia were provided to illustrate application of natural myopia improvement strategies. An analysis of the topic, including implications for society and the individual, conclude the manual. A professional review process was conducted to evaluate the quality of the manual’s content, readability, and format. Comments and suggestions collected during this professional review process were used to improve the quality of the manual.

Bloom, Debra. *Locus of control, physical self-efficacy and exercise frequency*, 1999. M.S., Springfield College (Mimi Murray). (133pp 2f $10.00) HE 676

Physical self-efficacy and locus of control are two variables that may influence the exercise intensity of exercisers and non-exercisers. The participants in this study included non-exercisers (n=65), moderate exercisers (n=68), and intense exercisers (n=66) who were between the ages of 18-55 and worked in a corporation with a fitness facility on site. The participants were asked to voluntarily respond to the Physical Self-Efficacy (PSE) (Ryckman et al., 1982) and Exercise Objectives Locus of Control (EOLOC) (McCready & Long, 1985) Scales. Intense exercisers had significantly (p<.05) higher levels of the composite Physical Self-Efficacy scores of the PSE Scale (Ryckman et al., 1982) than moderate and non-exercisers. No significant (p>.05) differences in mean Internality, Chance, and Powerful Others subscale scores of the EOLOC Scale (McCready & Long, 1985) were found across non-exercisers, moderate exercisers, and intense exercisers. Significant (p<.05) positive correlations were found between the Internal subscale scores of the EOLOC Scale (McCready & Long, 1985) and the Perceived Self-Presentation Confidence and composite Physical Self-Efficacy subscale scores of the PSE Scale (Ryckman et al., 1982).

Bonfiglio, T. R. *Aerobic fitness testing and feeling states among 9 to 11 year old students*, 2000. M.S.Ed., Northern Illinois University (Thomas E. Ball). (71pp 1f $5.00) HE 677

The purpose of the present study was to examine mean differences in positive well-being (PWB), psychological distress (PD) and fatigue (FAT) before and after three different fitness tests using the Subjective Exercise Experience Scale (SEES). The present study examined the
tendency of a subject to be competitive or non-competitive oriented using the Sport Orientation Questionnaire (SOQ). Subjects included 40 elementary male and female students ages 9-11 years old enrolled in two different physical education classes. Prior to the administration of the three fitness tests, all subjects completed the Sport Orientation Questionnaire (SOQ). The subjects completed the 1-mile run, 1-mile walk, and PACER shuttle run counterbalanced over a four-week time period, completing no more than one fitness test per week. Subjects were required to complete the Subjective Exercise Experience Scale (SEES) pre- and post-fitness test in order to determine changes in positive well-being, psychological distress, and fatigue. An ANOVA revealed no significant mean differences between a subject’s competitive orientation and fitness test among all SEES factors (PWB, PD, FAT). Data was further analyzed using a repeated measures ANOVA. A significant difference was indicated between mean differences among fitness tests for both positive well-being and psychological distress. No significant difference between mean differences among fitness tests was indicated for fatigue. These findings support the hypothesis that subjects would indicate higher mean differences of PWB after a lower exertion fitness test (1-mile walk) compared to high exertion fitness tests (1-mile run and PACER). Similarly, mean differences of psychological distress and fatigue were the smallest after completion of a low exertion test (1-mile walk) compared to a high exertion test (1-mile run and PACER).

Caputo, Jennifer L. Psychosocial stress and abdominal fat patterning in black premenopausal women, 2000. Ph.D., University of North Carolina, Greensboro (Don Morgan). (97pp 1f $5.00) HE 669

Independent of the degree of obesity, the accumulation of fat on the trunk is a potential health risk. It has recently been suggested that increased cortisol production resulting from psychological stress may provide a pathogenic background for the development of abdominal obesity (Bjorntorp, 1991b). To address this issue, perceived stress, cortisol levels, and abdominal fat were assessed under free-living conditions in 50 Black premenopausal women. Multiple cortisol measures were collected to gauge variability in cortisol release and body fat distribution was assessed anthropometrically using the waist-to-hip ratio (WHR), sagittal diameter, and waist circumference. Results indicated that neither cortisol or cortisol variability were significantly related to anthropometric estimates of abdominal fat. Perceived stress was negatively related to WHR and accounted for 11% of the variance in WHR when entered into a hierarchical regression model. Relationships between perceived stress and sagittal diameter and waist circumference, respectively, were stronger in the presence of lower cortisol variability and were negative in direction. Taken together, these data indicate that in this sample of Black premenopausal females, perceived stress was inversely associated with central fat accumulation and variability in cortisol response influenced this relationship.


The purposes of this study were to: (a) determine the interrater and intrarater reliability of individuals trained to use the fitness plan scoring rubric, (b) design and implement a training workshop that would maximize interrater and intrarater reliability of individuals trained to use the scoring rubric, and (c) design a self training manual that would render interrater and intrarater reliability similar to the workshop-trained participants. Twelve participants evaluated fitness plans using a scoring rubric designed by members of the Illinois State Board of Education’s Physical Development and Health Assessment Advisory Committee. The scoring rubric is an analytical rubric that is divided into four dimensions: (a) goal setting, (b) planning, (c) implementation, and (d) evaluation. Eight of the 12 participants were workshop-trained to use the rubric and the remaining 4 were self-trained to use the rubric. Each participant evaluated 10 fitness plans twice, half the plans one day apart and half on the same day. Interrater reliability was estimated by calculating percent agreement to true score. Results indicated moderate rater agreement with 7 of the 12 participants above 70% agreement on trial 1 and 10 of the 12 participants reporting total score agreement above 70% on trial 2. Intrarater reliability was estimated using a one-way repeated measure of ANOVA (norm referenced) and percent agreement with themselves (criterion referenced). Again, results indicated moderate rater agreement with two participants reporting a total percent agreement with self of less than 70%. A one-way ANOVA was computed to determine any significant differences between those individuals who were workshop-trained and those individuals who were self-trained. No significant difference was found to exist. The results of this study indicate the fitness plan scoring rubric is a reliable tool for evaluating fitness plans developed by high-school students.

Doyle, Mike N. The effect of phase II cardiac rehabilitation on self-efficacy and quality of life, 2000. M.A., San Francisco State University (Steve Evans). (38pp 1f $5.00) HE 679

Cardiac patients demonstrate a diminished self-efficacy (SE) and have a poorer quality of life (QOL) after a cardiac event. This study investigated the effect of a cardiac rehabilitation (CR) program on SE and QOL in patients who participated in the Seton Medical Center (N=24) and Sonoma Valley Hospital (N=1) programs compared to the Control group. The study used a non-equivalent control group design with participants either involved in a phase II CR program or receiving standard care. The SF-36 QOL questionnaire and SE questionnaires (as developed by
Johnson, Kandice M. *Relationship between body image and protective sexual health practices of sexually active heterosexual college women*, 2000. Ph.D., Indiana University (William L. Yarber). (165pp 2f $10.00) HE 666

The problem of this study was to determine the relationship between body image and protective sexual health practices among sexually active heterosexual female college students at a Midwestern university. In addition, the study’s aim was to examine the impact of these prevention practices on women’s overall sexual health. Body image may be manifested in many different forms (Thompson, 1991). Therefore, this study included measures of affective, cognitive, behavioral and perceptual body image. The survey instrument also included a protective sexual communication scale and sexual behavior inventory developed for use in this study. The survey instrument was administered to a convenience sample of over 500 female students. The final research sample consisted of 412 female students between 17 to 23 years of age, who had sex exclusively or primarily with male sexual partners in the last 12 months. T-tests revealed that college women who reported using condoms in the last 12 months had significantly higher levels of cognitive body satisfaction. Additional T-tests showed cognitive and behavioral body image to be significantly different by the practice of breast self-examination in the last 12 months. Women with higher levels of behavioral body satisfaction, were also statistically more likely to have had a gynecological examination in the last 12 months. Results of ANOVAs demonstrated a significant difference in behavioral body image by number of sexual partners in the last 12 months. Results of statistical analyses on affective and perceptual body image showed no relationship between these constructs and protective sexual health practices. In addition, T-tests did not show a difference in body image by incidence of sexually transmitted disease or unintended pregnancy. Standard multiple regression analysis demonstrated that body image variables were not significant predictors of percentage of condom or contraceptive use. In conclusion, the higher the level of cognitive and behavioral body satisfaction college women possessed, the more likely they were to engage in protective sexual health behaviors in the last 12 months. However, affective and perceptual body image were not related to protective sexual health behaviors. In addition, body image was not related to incidence of sexually transmitted disease or unintended pregnancy.

Kalda, Andrea L. *The effect of upper body exercise on secondary lymphedema following breast cancer treatment*, 1999. M.Sc., University of British Columbia (Donald C. McKenzie). (69pp 1f $5.00) HE 672

The effect of upper-body aerobic exercise on lymphedema secondary to breast cancer treatment was examined in 14 subjects. Subjects were assigned to either an Exercise group (n=7) or a Control group (n=7). Before subject recruitment, groups were created by selecting a subject number and a group out of two separate containers. As subjects were recruited, they were sequentially assigned a number, and thereby a group. One subject was allowed to enroll as a control subject instead of in the assigned exercise group for geographical reasons. All subjects were assessed over an eight week period, during which the exercise subjects followed an upper body exercise program including but not limited to a Monark Rehab Trainer arm ergometer. Control subjects maintained their lifestyle as before the study. Lymphedema was assessed by arm circumference measurements as well as arm volume measurements by water displacement. The Medical Outcomes Trust Short-Form 36 Survey was used to measure quality of life before and after the intervention. Significance was set at α≤.01. No changes were found in arm circumference or arm volume as a result of the exercise program. Three of the quality of life domains showed trends towards increases in the exercise group, although findings were not statistically significant: physical functioning (p=.050), general health (p=.048), and vitality (p=.023). Mental health increased, although not significantly, for all subjects (p=.019). Arm volume measured by water displacement was correlated with calculated arm volume (r=.973, p<.001), although the exercise and control group means were significantly different (t=24.19, p<.001). Arm volume does not appear to increase in women with Lymphedema following breast cancer due to participation in an upper-body aerobic exercise program, and they may experience an increase in quality of life. This suggests that further studies should be done in this area to determine the optimum training program.

Kinart, Chad M. *Prevalence of migraines in NCAA Division I men and women basketball players*, 2000. M.S., University of Nebraska, Omaha (Marchell C. Austin). (60pp 1f $5.00) HE 670
The purpose of this study was to describe the overall prevalence of migraines within NCAA Division I men and women’s basketball players. In addition, the prevalence of migraines was determined across gender and ethnic groups for the same sample. Seven hundred and ninety-one Division I men and women’s basketball players representing 51 colleges and universities were mailed surveys asking questions about headaches. All surveys were analyzed with a validated diagnostic algorithm consistent with the International Headache Societies criteria for diagnosis. Descriptive statistics were used to report the prevalence rate for gender and ethnic groups as well as the entire sample. Chi square tests were preformed (p = 0.05) to determine if there are any differences in the prevalence of migraines between gender and ethnic groups. Results showed that 2.91% (n = 23 of 791) of the total population was classified as having migraines meeting IHS guidelines. In addition, 0.90% (n = 3 of 332) of males and 4.36% (n = 20 of 459) of females were classified as having migraines meeting IHS guidelines. Additionally, results showed that females reported migraines (X2 = 8.140, p = 0.004) more often than males. When comparing the prevalence rates of migraines between ethnic groups, results showed that Caucasians had a rate of 3.26% (n = 14 of 429) while African Americans had a rate of 3.14% (n = 9 of 287). There was no significant difference found between ethnic groups in migraine prevalence (X2 = 2.491, p = 0.028). In conclusion, it was found that 1) the prevalence of migraines in NCAA Division I men and women basketball players was generally less that what was seen for the general population, and 2) females showed an increased prevalence of migraines when compared to males. Also, Caucasians and African Americans did not differ in prevalence of migraines.

Kinkade-Schall, Kristi L. Effects of a chair exercise program (Sit and Be Fit™) for older adults on functional health-related components of fitness, 2000. M.S., Eastern Washington University (Wendy Repovich). (60pp $5.00) HE 668

The purpose of this study was to determine the effects of a chair exercise program (Sit And Be Fit™) for older adults by assessing functional health-related components of fitness. Subjects volunteered to be in either an exercise (n=16) or control group (n=6) and consisted of women with a mean age of 81.50 ±7.29 years for the exercise group and 83.66 ±5.16 years for the control group. All subjects had medical clearance and signed informed consents prior to being tested. Members of the exercise group participated in a thirty-minute, thrice-weekly chair exercise program (Sit And Be Fit™) for seven-weeks, while the control group maintained their normal everyday activities. Pre- and post-assessments of upper and lower body strength, aerobic endurance, upper and lower body flexibility, and speed, agility and balance were measured using the Fullerton Functional Fitness Test Battery (Rikli & Jones, 1999) within one week of starting and finishing the classes. Small, nonsignificant improvements were observed in the treatment group in the measures of strength and agility and balance. Both flexibility measures showed a slight decline, though remained within the normal range for the age group. Virtually no change was seen in aerobic endurance. Statistically, nonsignificant decreases in functional fitness measures were observed in the control group for all tests, except the 2-minute step-in-place test measuring aerobic endurance. A program of higher-intensity or longer-duration may be needed to see statistically significant results in levels of functional fitness in older adults, although it appears that Sit And Be Fit™ is a safe and moderately effective exercise program.

McCormick, Gail L. Middle school health education curriculum aligning with the Minnesota graduation standards, 2000. M.S., University of Wisconsin, La Crosse (Mark Kelley). (92pp $5.00) HE 674

This project is designed to integrate performance-based education into middle school health education curriculum at Caledonia High School. The outcomes are aligned with the Minnesota State Department of Education’s proposed Graduation Standards profile of learning, Course and lesson outcomes, along with authentic assessments, are included as they relate to mental and emotional health, safety, substance abuse, personal health, prevention and control of diseases, nutrition, family life, and body systems. The focus is to assist middle school students in making sound decisions for healthy lifelong living. The main purpose for health education is to understand and practice healthy behaviors, demonstrate healthy decision making processes, and learn how to gain access to health information resources which will be used for a lifetime. The Minnesota Graduation Standards challenge teachers to incorporate many additional action oriented strategies, where learners become active participants. Utilizing a variety of teaching strategies, students become actively involved in their learning experiences. These strategies allow for performance-based assessments with the goal of improving student learning and classroom instruction.

McNiff, Sheran K. Self-injury and body modification among college freshmen attending a midsize, comprehensive university in the Midwest, 2000. M.P.H., University of Wisconsin, La Crosse (Richard Detert). (54pp $5.00) HE 675

Adolescents and young adults are acknowledging self-injury (SI) behaviors more frequently and acquiring more body modifications (tattoos and body piercings). College freshmen (N=1,725) were sent surveys regarding body modification (BM) and SI with a return rate of 21% (n=362). Forty-one percent (n=151) reported intentional SI. The M onset age was 13.4, and the M cessation age was 16.0. Continuing SI was reported by 58% of the self-injurers. The
most common forms of SI were biting inside of mouth (25%, n=89), biting fingernails or cuticles with blood (20%, n=74), scratching self without blood (14%, n=50), punching walls (13%, n=46), and cutting arms or legs (7%, n=26). There was no statistically significant difference found in the amount of SI between females and males, and a weak relationship was found between total BM and total SI (r=.08). The SI reported by this population was more than has been reported in other studies. A more precise survey instrument needs to be developed, and further studies need to examine other populations, especially adolescents. If indicated, prevention and intervention strategies should be provided.

O'Toole, Terrence P. *Personality types and tobacco use of Georgia college students*, 1999. Ph.D., Indiana University (Mohammad R. Torabi). (131pp 2f $10.00) HE 665

The problem was to determine whether a relationship exists between psychological types, as determined by the Myers-Briggs Type Indicator (MBTI), and tobacco use among college students. The study was a cross-sectional survey of students, aged 18 to 24 years, from 8 Georgia colleges and universities. 1,029 students were recruited from personal health/wellness or introductory psychology classes. The MBTI categorized each subject into 1 of 16 MBTI types. The Tobacco Use Inventory questions were adopted from the 1995 National College Health Risk Behavior Survey and yielded the tobacco use data. Three hypotheses were proposed to test the 2 research questions and were evaluated via logistic regression statistics technique and chi-square tests. Alpha level was set at .05. MBTI type INTP was associated with the highest probability of smoking and type ISTJ was associated with the lowest probability for smoking. Type ISTJ represented half as many smokers as expected and INTP had significantly more smokers than expected. Type ISTP had twice the number of lifetime daily smokers than expected. ESFP had more current smokers and ESFJ represented fewer current smokers than expected. The collapsed category ESTP-ESFP-ENFP-ENTP depicted 1.6 times the former smokers as expected. The category ISTJ-ISFJ-INFJ-INTJ revealed significantly fewer current smokeless tobacco users as expected. MBTI types characterized by spontaneity in decision-making, a desire for new ideas and experiences, and curiosity appear to have some level of predictive value for smoking. Attributes of open-mindedness and adaptability tend to be associated with former smokers. Decisive introverts, persons who desire to protect themselves from unnecessary, undesirable experiences, reflect before acting, and seek structure in life, tend not to be smokeless tobacco users. This study confirmed the recent increase in tobacco use initiation and prevalence rates among college students. There is a need for college student assistance programs that target tobacco use prevention. Type awareness might offer a means of prevention in the college health class. By determining a student’s psychological type, health educators could tailor learning activities considering the student’s individual type, considering those types that tend toward tobacco use at some level.

Parkhurst, Diana L. *Comparison of attitudes toward physical activity and physical activity levels of sixth grade boys and girls of various ethnic origins*, 2000. M.S., Springfield College (Deborah Sheehy). (169pp 2f $10.00) HE 680

The study was designed to compare attitudes toward physical activity and physical activity levels of Caucasian, African American, and Hispanic boys and girls in sixth grade. A total of 372 children, 182 boys and 190 girls, were used for analysis in the investigation. The Children’s Attitudes Toward Physical Activity (CATPA; Schutz, Smoll, Carre, & Mosher, 1985) inventory was utilized to assess attitudes across eight subdomains. The Previous Day Physical Activity Recall (PDPAR; Weston, Petosa, & Pate, 1997) instrument was used to determine physical activity levels. A total of nine 2 x 3 factorial analyses of variance (ANOVA) were used to analyze differences in attitudes toward physical activity and physical activity levels based on gender and ethnic origin. African-American boys possessed more positive attitudes than African-American girls in the Ascetic subdomain. Boys possessed more positive attitudes toward the Vertigo subdomain, whereas girls were more favorable toward the Aesthetic subdomain. Boys were found to possess higher physical activity levels when compared to girls using the PDPAR inventory. Finally, the Ascetic, Catharsis, and Vertigo subscales of the CATPA correlated positively with the total daily energy expenditures of the PDPAR instrument.

Patterson, Tara S. *The effects of a therapeutic horseback riding experience on selected behavioral and psychological factors of ambulatory adults diagnosed with multiple sclerosis*, 2000. M.Ed., Bowling Green State University (Patricia A. Shewakis and Susan Gavron). (86pp 1f $5.00) HE 681

Therapeutic horseback riding is a recreational activity that has been popularized for persons with disabilities during the past decade. Unfortunately, there is a paucity of research on therapeutic horseback riding (Blery & Kauffman, 1989; Haehl et al., 1999; MacKay-Lyons et al., 1988), especially for adults diagnosed with multiple sclerosis. The focus of the present study was to test the effects of a seven-week therapeutic riding intervention on selected psychological and physical measures of eight adults diagnosed with multiple sclerosis. The psychological measures included Fox’s Self Perception Profile (PSPP; Fox & Corbin, 1989) and the Activities-Specific Balance Confidence Scale (ABC; Powell & Meyers, 1995). The physical measures included postural sway and gait analysis. Postural sway was evaluated from a force
platform (AMTI Model #OR6-5-1000). Gait was measured by having each participant walk at three different speeds down a 15-meter pathway. The time and number of steps taken to walk 10 meters were used for data analysis. A one way repeated measures ANOVA with three levels (pre-, mid-, and post-) was performed on the psychological and gait measures. A 2x3 ANOVA (Eyes x Time) was performed on the postural sway data. The alpha level for each test was set at $p<.10$. Findings revealed a significant change for eight questions in the ABC scale. Significant difference from post hoc analyses indicated that changes occurred from the pre- to mid-test for two questions, and from mid- to post- and pre- to post-testing for six questions ($p<.10$). The PSPP Body subscale demonstrated significance with $p=.08$. This may be related to decreased feelings of self-esteem occurring due to inactivity with the progression of disease symptoms. Gait measures demonstrated a significant change for the fast time speed during the post-test measure ($p=.07$). Postural sway data revealed significant change for the total sway across the anterior/posterior axis and mediolateral axis ($p=.08$). Overall, the results for this study were inconclusive and unreliable, due to low sample size and insufficient statistical power.

Sterling, Shirley A. *The relationship between age, gender, disease, physical activity and functional abilities in the elderly*, 2000. M.S., Purdue University (Roseann M. Lyle). (124pp 2f $10.00) HE 682

One hundred and fifty-eight elderly male (n=55) and female (n=103) volunteers, 60 to 97 years old (mean age=71.8yrs) participated in this cross sectional study of the relationship between functional abilities and age, gender, disease and physical activity. Participants completed a questionnaire and performed the Lifespan Physical Assessment (LPA) test. Subgroups were created according to age (<75, n=95; ≥75, n=63); disease (0 disease, n=43; 1 disease, n=56; ≥2 diseases, n=69), and activity (sedentary, n=56; active, n=31 and very active, n=69). The LPA test battery measured upper and lower body strength (arm curl and chair stand); upper and lower body flexibility (scratch test and chair sit-and-reach); speed, agility, and dynamic balance (up-and-go); and cardiovascular fitness (2-min step, 6-min walk). On average, those <75 years performed better than those ≥75 years on all tests with ANOVA indicating significant differences for the chair stand ($p=.01$, up-and-go ($p=.001$), 6-min walk ($p=.001$), and 2-min step ($p=.001$). Gender-based differences included the following: males scored higher in the chair stand ($p=.02$), arm curl ($p=.001$), up-and-go ($p=.02$), 6-min walk ($p=.02$), and 2-min step ($p=.04$); and females scored higher in the scratch test ($p=.01$). When age was controlled, there was no longer a significant difference on the 2-min step test. Disease had impact on performance such that participants with no disease did better on the sit-and-reach, up-and-go, and scratch tests than participants with diseases ($p<.05$). Finally, physical activity accounted for differences in performance such that those who were sedentary performed worse than those who were active or very active on the chair stand ($p<.05$), arm curl ($p=.01$) and up-and-go ($p=.02$). Multiple regression analysis with age, gender, disease, and activity level as the independent variables, and performance on each LPA test as the dependent variable, resulted in the following: age was included in the regression models for all tests except the scratch test; gender was included in models for the arm curl, scratch test, up-and-go, and 6-min walk; disease was a significant contributor to models for the scratch test, up-and-go, 6-min walk, and 2 min step, and activity contributed to models predicting chair stand, arm curl, and up-and-go results. Thus, this investigation provided evidence that age, gender, disease, and physical activity have the potential to influence functional abilities to varying degrees in the elderly.

Sydzyik, Robyn. *A brief intervention on environmental tobacco smoke and the attitudes and behaviors of childcare providers*, 2000. M.S., University of Nebraska, Omaha (Richard Stacy). (57pp 1f $5.00) HE 671

The American Medical Association (1999) asserts specific dangers from exposure to environmental tobacco smoke (ETS) for infants and children, including higher incidence of sudden infant syndrome (SIDS), and higher risk for respiratory problems such as asthma, bronchitis, colds, middle-ear disorders, pneumonia, and reduced lung function. The AMA also offers suggestions for protecting children from the dangers of secondhand smoke, including not allowing smoking in the home or workplace, near children (especially with asthma), in closed compartments (like cars), and spending minimal time in smoky environments such as bars or homes of people who smoke. With regard to ETS and the childcare setting, this study intended to employ the self-efficacy, outcome-expectation and outcome-expectancy constructs of the social cognitive theory (SCT), (Glanz, Lewis and Rimer, 1997), to promote a change in attitudes and behaviors regarding environmental tobacco smoke. The instrument, a 35-item questionnaire, was developed to measure participants’ self-efficacy to create a smoke-free childcare setting, anticipate outcomes of creating a smoke-free environment, and the values placed on the outcome of a smoke-free childcare facility before and after a brief intervention. The subjects self-selected by responding to the questionnaire sent to a population of 167 providers participating in the Healthy Alternatives for Little Ones program. Nineteen childcare providers completed the pre-test, brief intervention and post-test. Results of the study indicated that the brief intervention did not produce significant changes in attitudes and behaviors. In order to produce the desired results in the future, the sample size of subjects must be increased, instrument error reduced and the intervention should be based on Social Cognitive Theory constructs.
The subjects in this investigation were 10 females diagnosed with fibromyalgia. The subjects were assigned to either a control group (ADLO) who performed only activities of daily living, or an experimental group (AQUA) who participated in the Arthritis Foundation YMCA Aquatic Program (AFYAP). The effects of the eight-week water exercise program were examined. Each group completed the Fibromyalgia Impact Questionnaire at the beginning and conclusion of the study. Descriptive statistics were used to analyze the data. The following conclusions appear warranted within the limitations of the study. The AQUA group showed the greatest improvement in the areas of wellbeing, depression and anxiety. The least affected areas were pain, stiffness, and sleep quality. Individuals with fibromyalgia can safely participate in water exercise without any negative effects.


Worldwide, breast cancer is the second-most-common cause of cancer deaths in women (Harvey and Beatte, 1996). It is estimated that by the year 2000, one million women a year will receive a diagnosis of breast cancer, while in Canada alone, the disease develops in 18,400 women every year (National Cancer Institute of Canada, 1997). The development and improvement of new treatment modalities for breast cancer have resulted in increasing cure rates and longer disease free survival, making the outcome of cancer therapy increasingly important. Damaging effects of cancer therapies can occur in the heart and lungs and therefore are thought to impede the patient’s functional capacity and ability to exercise. The purpose of this study was to characterize the early changes in functional capacity that occur in women diagnosed with stage II breast cancer, whose treatment involves a schedule of mastectomy and adjuvant chemotherapy. Nine female patients performed the treatment protocol at three different sessions: 1) after diagnosis of breast cancer but before surgery, 2) following surgery but before beginning chemotherapy, and 3) following chemotherapy. Testing sessions involved two protocols and the subjects served as their own controls throughout the three tests. Firstly, resting pulmonary function was assessed using the Spirometry software package on the Medical Graphics CPX-D Metabolic Cart. Forced Vital Capacity (FVC), forced expiratory volume in one second (FEV1), the ratio of the two (FEV1/FVC), and maximal voluntary ventilation (MVV) were measured. The second protocol was a VO2max test on an electronically-braked cycle ergometer (Lode BV Excalibur V2.0) using a Medical Graphics CPX-D Exercise Testing System. Measurements included maximal heart rate (HRmax), minute ventilation (V̇E), maximal oxygen consumption (VO2max), and peak power output (PPO).

Hurd, Amy R. The influence of management styles upon the use of extrinsic and intrinsic rewards in selected public park and recreation agencies, 1999. M.S., Indiana University (Daniel D. McLean). (120pp 2f $10.00) RC 539

This study examined how management styles of supervisors in public parks and recreation influence their use of intrinsic and extrinsic rewards. Eighty-six supervisors from Illinois and Ohio public parks and recreation agencies completed and returned the survey. Their management styles were measured using the Blake Mouton Management Grid. Of the seven possible management styles, five were selected, with 64% of the respondents selecting the 9,9 (high concern for people and high concern for productivity) and 15% selecting the 5,5 management style (moderate concern for people and moderate concern for productivity). Intrinsic and extrinsic rewards were measured using a list of 24 rewards that were evenly divided among intrinsic and extrinsic categories, and 5 point Likert Scale responses were totaled and resulted in an extrinsic score and an intrinsic score. The results indicated that there was no difference in the use of intrinsic and extrinsic rewards (p=.341) and that was no interaction between management styles and intrinsic and extrinsic rewards (p=.702). In further examining individual management styles, it was found that there is a difference between the 9,9 and 5,5 managers in how they use intrinsic rewards (p=.014) and extrinsic rewards (p=.008). However, those significant findings were not strong enough to have an impact on the overall measure of management styles and rewards.

This study examined the predictors of job satisfaction for residential outdoor teachers in Ohio. A measure of job satisfaction, along with a measure for each of eleven independent variables, was administered to 116 residential outdoor teachers during the spring of 1999. A linear multiple regression equation was utilized to test the predictive ability of the independent variables. The eleven independent variables, or predictors, measured in the study were: (a) job tenure, (b) educational level, (c) age, (d) sex, (e) pay satisfaction, (f) promotion opportunity, (g) task clarity, (h) task significance, (i) coworker relationship, (j) supervisor relationship, and (k) personal organizational values congruence. Among these variables, promotion opportunity, task significance, and supervisor relationship were found to significantly predict job satisfaction (p < .001). Together these three variables accounted for 44% of the variance in job satisfaction scores. The final multiple regression equation was found to be: Y′ = 39.28 + (2.44)(supervisor relationship) + (3.68)(task significance) + (2.00)(promotion opportunity), with a standard error of 5.78. Pay satisfaction, personal-organizational values congruence, and job tenure length were found to have statistical relationships to job satisfaction, but these relationships were not predictive.

Maningas, Michael. *Preparing to be an entry-level outdoor leader: hiring preferences of AEE accredited organizations*, 2000. M.S., University of Wisconsin, La Crosse (Steve Simpson). (202pp 3f $15.00) RC 542

A qualitative study was performed to examine the hiring preferences of organizations (N=33) accredited by the Association for Experiential Education. Examples of such organizations include university outdoor programs, therapeutic adventure programs, and outdoor education centers. An original questionnaire was developed and mailed to the staffing manager of each organization. The mailing was followed by a telephone interview developed and mailed to the staffing manager of each organization. The mailing was followed by a telephone interview was averaging 25 minutes in length. A response rate of 81.8% (n=27) was obtained. Each interview was transcribed and a content analysis was done in order to identify, code, and categorize key patterns in the data. Results of data analysis were used to create a handbook that provides career guidance for individuals interested in pursuing a position as an entry-level outdoor leader. The study generated some significant results, such as: 4 of the top 8 desired certifications were medically associated, while the Wilderness First Responder certification was preferred by almost half of the staffing managers interviewed. Over 55% desired college level schooling, while 44% of the respondents indicated a high priority would be given to applicants with outdoor school training, like the National Outdoor Leadership School or Outward Bound. More than 70% of the staffing managers identified the Internet as an advertising source used to acquire potential outdoor leaders. Other trends included: the belief that one can make a career of being an outdoor leader as long as he or she is willing to become an administrator or trainer and that staffing managers are more likely to hire someone who possesses solid soft skills than specific field skills.

Oishi, Ann M. *Trends affecting women golfers in British Columbia*, 2000. M.H.K., University of British Columbia (Lucie Thibault and Robert Sparks). (48pp 1f $5.00) RC 541

There has been a worldwide increase in the popularity of golf (cf. National Golf Foundation, 1999a; Stoddart, 1990). Golf is becoming very mainstream in Canadian society. Traditionally, golf was viewed as an elitist sport, played by affluent men in society who belonged to private clubs; but this image of a typical golfer is quickly changing. According to data from the Royal Canadian Golf Association (RCGA, 1999a), the national golf participation rate has increased over 8% in a span of two years. The RCGA estimates that the national golf participation rate for Canadians is 20.5%; that is, approximately 5.2 million people in this country play golf. Women account for 28%, or 1.5 million of the golfers in Canada. In 1999, the RCGA determined that the largest increase in the number of golfers is in the beginner golfer category, and 42.5% of all beginner golfers are women. The RCGA offers a general demographic profile of Canadian female golfers: 46.4% of women golfers are between the ages of 25-44 years; the average household income is over $50,000, and 54.7% of women golfers have white collar occupations; British Columbia has the third highest participation rate of female golfers in the country at 16.5% (behind Ontario and Quebec). 88.2% of women golfers are not members of a Private Club; they play golf on public courses. According to recent statistics from the Canadian Ladies Golf Association (CLGA, 1998) and the British Columbia Ladies Golf Association (BCLGA, 1999), there are over 98,000 women in Canada and 19,000 women in British Columbia who belong to CLGA member clubs. Even though these numbers are impressive, research has shown that a number of women are dropping out of golf within the first few years of being introduced to the sport (Blank, 1998, Meyers, 1998). One current challenge in golf is to figure out how to retain women as participants in the sport. A recent National Golf Foundation (NGF) publication noted a common problem for the United States. Over the last decade, golf has been very successful in attracting new participants, ranging from 1.5 to 3 million people per year. The problem, though, has been one of retention. As many are leaving as are entering the sport. The industry has not been able to deliver an experience that stimulates more golfers to stay with the game, nor has the industry been able to provide an experience that motivates the average golfer to play more often (NGF, 1999a, p. 2). As noted by the Executive Director of the RCGA, “the Canadian golf
industry can pat itself on the back for helping to boost the game's popularity. It is now our responsibility to provide Canadian golfers with all the resources and services they need to play this game of a lifetime” (RCGA, 1999b). All of the statistics and current research indicate that golf's popularity is growing. Unfortunately what the research fails to address is the rate of attrition among female golfers. A recent report by Berkley (1999) noted that “women are taking up the game of golf in far greater numbers than any other segment. Unfortunately, women are also leaving the game in far greater numbers than any other segment.” This is a challenge for golf courses as well as for the sport of golf. To this end, this paper investigated these challenges. The purpose this paper was two-fold: a) to examine the reasons or trends affecting the increase in the number of women taking part in recreational golf in British Columbia and b) to examine the reasons and challenges associated with retaining these women golfers in the sport. An exploratory study using a qualitative research methodology was undertaken to investigate the general trends of women golf participants in British Columbia. The information gathered for this study was done through a series of interviews with key golf and golf-related experts. Data was also obtained from various sources such as popular literature (e.g., golf magazines and books), an exhaustive search on the Internet, and document analyses of reports completed by the Royal Canadian Golf Association (RCGA) and the British Columbia Professional Golf Association (BCPGA). The results and discussion of the data are presented in two major sections. The first section discusses the general trends favoring women's introduction to golf and their involvement in the sport. These trends include a variety in the types of facilities, an increase in the products, equipment and apparel available, more women in leadership roles, an increased educational component, and financial accessibility. The following section focuses on the challenges associated with retaining these women in golf. The challenges identified were facilities, gender discrimination, the big business approach to the golf industry, the job descriptions of today’s golf professionals, the lack of an overall governing body for golf, and personal factors. In the conclusion, recommendations are provided to assist women's involvement and retention in golf. In essence, an education program helping women learn the basics of the game would enrich their golfing experience. As well, the presence of more women leaders and golf professionals may help new women golfers feel more comfortable about joining the sport. Access to facilities and equipment may also help improve women's initiation to the game and subsequent adoption of golf as a lifelong practice.

Roark, Mark F. Counselor motivations for choosing summer resident camp employment, 2000. M.S., Western Illinois University (Dean A. Zoerink). (86pp 1f $5.00) RC 543

Camp administrators face many issues limiting their recruitment of quality camp staff every year. Previous research indicated the need for more information regarding the motivations of camp staff. Hoff, Ellis, and Crossley (1988) concluded that there is a need to understand how to attract, motivate, and retain seasonal recreation employees. They suggested that leisure agencies might use Herzberg’s Motivation Hygiene Theory as a basis for designing strategies for recruitment, job design, and development of seasonal personnel. The purpose of this study was to examine the degree to which motivation and hygiene elements influence personal decisions to become summer resident camp counselors. Participants were counselors (N=190) of Illinois resident camps. The instrument used was a survey questionnaire. The coefficient alphas for the motivation items, α=.80, and the hygiene items, α=.84, were calculated. The data of this study were quantitatively analyzed. Descriptive statistics were used to determine the mean responses for the motivation and hygiene items which were rank ordered indicating counselors’ level of importance. Using an alpha level of .05, ANOVA statistical procedures were used to compare mean differences. If statistical significance was reported, post hoc analyses were performed to identify the significance between attributes of the independent variables. Rank ordered means revealed that personal satisfaction, personal growth and the opportunities to be a role model for youth, work with youth, meet people, and make new friends were important items to consider when recruiting camp counselors.

**PSYCHOLOGY**

Croston, Amanda L. Team cohesion and gender-role orientation, 2000. M.S., Springfield College (Mimi Murray). (119pp 2f $10.00) PSY 2136

The study was designed to investigate differences in team cohesion of male and female high school basketball players, according to sex and gender-role orientation. Student-athletes (N=164) completed the Bem Sex-Role Inventory (BSRI; Bem, 1977) and the Group Environment Questionnaire (Carron, Widmeyer, & Brawley, 1985) at the end of the basketball season. Individual gender-role orientations were determined by the median scores obtained on the BSRI (Bem, 1977) which were: 5.37 for the feminine scale, and 4.65 for the masculine scale. The participants were not evenly distributed into the gender-role orientations. The smallest cell contained 10, and subsequently 10 student-athletes were randomly selected within each gender-role category for both males and females (N=80) in order to make statistical comparisons. A 2X4 analysis of variance was computed for each subscale on the team cohesion questionnaire. The interactions of sex and gender-role orientation were not significant (p>.05) for
all four of the cohesion subscales. No significant (p > .05) main effects were found for the cohesion subscales. To conclude, high school athletes do not differ in their perceived levels of cohesion in relation to their sex or gender-role orientation.

Etzbach, Mark E. Physical activity motivation of adolescents: an impression management perspective, 2000. M.S., Purdue University (Alan L. Smith). (118pp 2f $10.00) PSY 2150

Despite the well-known benefits of a life-long commitment to active living (see USDHHS, 1996), physical activity levels have been shown to drop abruptly across the adolescent years (Sallis & Patrick, 1994). Sport and exercise psychologists have made initial attempts to understand this phenomenon by adopting a motivational perspective (Smith, 1999), but more research is needed. Therefore, the purpose of this study was to examine adolescent physical activity motivation and behavior utilizing an impression management perspective. Specifically, public self-consciousness, perceived social acceptance, and body satisfaction were proposed to be associated with the experience of social physique anxiety (SPA) which, in turn, was proposed to be associated with physical activity motivation and behavior. I hypothesized five specific relationships between the variables. The first three hypotheses were based on impression management literature with regard to antecedents of social anxiety (Schlenker & Leary, 1982). It was hypothesized that public self-consciousness would be positively associated with SPA (see Fenigstein, 1979), body satisfaction would be negatively associated with SPA (see Martin, Rejeski, Leary, McAuley, & Bane, 1997), and perceived social acceptance would be negatively associated with SPA (see Schlenker & Leary). The final two hypotheses emanated from theoretical literature linking affect with motivation (Deci & Ryan, 1985; Harter, 1978) and supporting empirical efforts (Plant & Ryan, 1985; Smith). Specifically, it was hypothesized that SPA would be associated with a negative physical activity motivational profile and less physical activity behavior. The first set of hypothesized relationships was supported in the current investigation. Public self-consciousness was positively associated with SPA, body satisfaction was negatively associated with SPA, and perceived social acceptance was negatively associated with SPA. The second set of hypothesized relationships was also supported in the current investigation. Individuals who experienced lower levels of presentation comfort (PC) and greater fear of negative evaluation (NE) experienced higher levels of amotivation and the extrinsic means of motivation, and lower levels of the intrinsic means of motivation and physical activity behavior. Gender differences were found for the second set of hypothesized relationships. For females both PC and NE were positively associated with amotivation and the extrinsic means of motivation, and negatively associated with physical activity behavior. Two relationships emerged for males. Presentation comfort was positively associated with amotivation, and negatively associated with the intrinsic means of motivation and physical activity behavior, whereas NE was instrumental in the positive relationship with the extrinsic means of motivation. These findings are discussed relative to their theoretical and practical implications, and future directions are forwarded.


The investigation was designed to determine if a relationship exists between competitive state anxiety and performance of high school basketball players. Participants from three independent high schools in New England (N=42) were assessed during two time periods: immediately prior to competition and immediately following competition. The participants were administered the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Vealy, & Burton, 1990). Performance was measured using game versus season shooting percentages. No significant (p > .05) linear relationships were found between pre-competitive state anxiety and athletic performance using a Pearson Product Moment-Correlation Coefficient; however, a significant (p < .05) negative linear relationship was found between post-competitive state anxiety and athletic performance. Male basketball players were found to have lower levels of cognitive anxiety and higher levels of self-confidence than female basketball players across both time periods. Somatic anxiety was similar for both male and female basketball players across both time periods. Future researchers may wish to examine the influences of post-competitive state anxiety on subsequent performance of basketball players, as well the use of post-competitive anxiety to improve athletic performance.

Hemrick, Christina L. The moderating effects of humor on cognitive appraisals of stress, 1999. M.A., Appalachian State University (Denise Martz). (70pp 1f $5.00) PSY 2134

A growing body of research indicates that humor may act to buffer the impact of stress, resulting in a reduction of stress-related disorders and disease. Numerous studies support the assumption that humor serves to lessen the impact of stressful events and mood disturbance (Lefcourt & Davidson-Katz, 1991). Based on Lazarus and Folkman’s (1984) theoretical model of cognitive appraisal of stress, the moderating effects of humor were investigated. The effects of humor on primary appraisal and reappraisal of a stressful situation, the cold pressor test, were examined with humorous and neutral video clips. Participants were randomly assigned to one of five conditions: humor during primary appraisal (N=22), humor during reappraisal (N=22), neutral stimulus during primary appraisal (N=24),
neutral stimulus during reappraisal (N=24), or no humor or neutral manipulation control group (N=25). Participants’ mood, anxiety, and positive and negative affect were measured in all groups after the stressful stimulus (i.e., cold pressor test) assessing reappraisal of the stressful event. Results showed that humor or mere distraction did not affect mood, anxiety levels, or positive or negative affect when compared to the control group. Correlational analysis revealed a relationship between how physically stressful and painful the participants found the cold pressor and how negatively threatening they perceived the stressful event across all five groups. In conclusion, further research is needed to understand the exact processes by which humor affects cognitive appraisals of stress. Limitations of the present study and future research implications were also discussed.

Hoffman, Jeffery D. *Sport-confidence and perceptions of coaching behavior of male and female high school basketball players*, 2000. M.S., Springfield College (Mimi Murray). (141pp 2f $10.00) PSY 2139

Determining the levels of confidence athletes possess, as well as the way in which athletes perceive the behaviors of their coach, are issues in sport. The participants in this study included male (n=39) and female (n=42) high school basketball players. The student-athletes were asked to voluntarily respond to the Trait Sport-Confidence Inventory (TSCI; Vealey, 1986), State Sport-Confidence Inventory (SSCI; Vealey, 1986), and the Coaching Behavior Questionnaire (CBQ; Kenow & Williams, 1992). The negative relationship between perceptions of coaching behavior and trait and state sport-confidence was significantly (p<.05) less than zero. In addition, the mean trait and state sport-confidence scores of males were significantly (p<.05) higher than the mean trait and state sport-confidence scores of females; however, the mean perceptions of coaching behaviors were not significantly (p>.05) different for males and females. Finally, no significant (p>.05) interaction was found between competitive setting and gender of the participants with respect to perceptions of coaching behavior. Male and female high school basketball players tend to experience higher levels of confidence when they perceive their coach as displaying positive coaching behaviors; however, males tend to possess higher levels of confidence than females.

Kontos, Anthony P. *The effects of perceived risk, risk-taking behaviors, and body size on injury in youth sport*, 2000. Ph.D., Michigan State University (Deborah L. Feltz). (128pp 2f $10.00) PSY 2133

This study examined perceived risk of injury, risk-taking behaviors, perceived ability, body size and injury among 253 (142 male, 111 female) competitive and recreational soccer players aged 11 to 15 years. All psychological variables were assessed at the beginning of the season using self-report measures. Body weight and height were obtained using a field anthropometer and digital weight scale. Prospective injury data were recorded for matches and practices during an 8-week soccer season. A confirmatory factor analysis (CFA) for the Risk of Injury in Sports Scale (RlSSc) supported the six-factor, hierarchical structure previously reported by Kontos, Feltz, and Malina (2000). Results of an exploratory factor analysis (EFA) for the Risk-Taking Behaviors Scale (RTB) supported a two-factor solution involving 9 of the original 12 items. Participants high in body mass index (BMI: kg/m²) reported higher levels of perceived risk on the General and Overuse factors of the RlSSc. Perceived ability was positively related to scores on the RTB, suggesting that more confident athletes engage in more risk-taking behaviors. An inverse relationship between the RlSSc and RTB was found only among athletes who overestimated their abilities (compared to coaches’ ratings). In support of previous research (King et al., 1989), girls reported significantly higher levels of perceived risk of injury across all factors of the RlSSc than did boys. Boys reported engaging in significantly more risk-taking behaviors than did girls, supporting the findings of Morrongiello and Rennie (1998). As expected, the number of previous injuries was positively related to scores on the RlSSc. A total of 2,686 exposures, 21 injuries, and 35 nuisance (i.e., player returned to play the following day) injuries were recorded, resulting in an injury incidence (non-nuisance) rate of 7.8 injuries/1000 exposures. The 21 injuries resulted in a total of 197 days of time loss for the injured athletes. As predicted, most injuries were to the ankle and knee, and were the result of contact with another player during a match. One-half of all recorded injuries were attended to either by a coach or parent. Case-control analyses revealed that BMI and an under-estimation of ability were significant risk factors for injury. The discussion examines implications of the findings, directions for future research, and provides support for a new developmental model of injury for youth sports.

Lofton, Stacy L. *Attitudes and behaviors toward weight, body shape and eating in male and female college students*, 2000. M.S., University of North Texas (Timothy J. Bungum). (95pp 1f $5.00) PSY 2130

The purpose of this investigation was to assess the association between body mass index, as well as race/ethnicity, and established correlates of disordered eating, including drive for thinness, body dissatisfaction, bulimia, dietary restraint, and social physique anxiety in male and female college students. Difference between actual, desirable, and perceived body weight was also assessed. ANOVA suggested that as actual body mass index increased, in general, attitudes and behavior toward weight, body shape and eating increased. Mean scores for social physique anxiety were shown to differ significantly between normal weight male subjects and male subjects classified as...
underweight and obese (p<.05). A two-tailed t-test suggested that males and females differed significantly with regards to attitudes and behavior toward weight, body shape, and eating. ANOVA indicated that little to no association existed between race/ethnicity and established correlates of disordered eating.

Maday, Kristen M. Goal orientation and level of satisfaction in runners, 2000. M.S., Springfield College (Barbara Jensen). (146pp 2f $10.00) PSY 2140

The study was designed to examine the relationship between goal orientation and satisfaction among collegiate cross country runners. The Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda & Nicholls, 1992) and The Athletic Satisfaction Questionnaire (ASQ; Riemer & Chelladurai, 1998) were administered to 175 male and female collegiate cross-country runners participating in the New England area at Division III institutions. Age, gender, years of experience, and ability level were also obtained. Positive significant (p<.05) relationships were found between 11 satisfaction subscales and Task Orientation, and negative significant (p<.05) relationships were found between four of the satisfaction subscales and Ego Orientation. Significant (p<.05) mean differences were found between males and females on six satisfaction subscales. In conclusion, task-oriented individuals scored higher on satisfaction subscales pertaining to Team Social Contribution, Personal Dedication, and Medical Personnel. Women were more satisfied with Team Performance, Budget, Medical Personnel, and Academic Support Services, while men were more satisfied with Personal Dedication and Team Social Contribution.

Mann, Lisa E. The influence of mothers on differences in role conflict and gender typing of sports for females, 2000. M.S., Springfield College (Linda Delano). (125pp 2f $10.00) PSY 2143

The study was designed to investigate the differences in perceived and experienced role conflict and gender typing of sports for the following groups: (a) female athletes whose mothers participated in sport; (b) female athletes whose mothers never participated in sport; (c) female nonathletes whose mothers participated in sport; (d) female nonathletes whose mothers never participated in sport. The participants in this study included females (N=84) aged 13 to 16 years from high schools in Connecticut. Each participant responded to the Athletic Sex Role Conflict Inventory (ASRCI; Sage & Loudermilk, 1979), the Physical Activity Stereotyping Index (PASI; Ignico, 1989), and a demographic questionnaire. A 2x2 independent groups factorial design was utilized with athletic status and participation of the mother in sport as the two independent variables. No significant differences (p>.05) were found between athletes and nonathletes or between females whose mothers participated in athletics and females whose mothers never participated, in regards to role conflict (perceived or experienced) and gender typing of sports. No interactions were found (p>.05) between athletic status and maternal participation level in regard to role conflict or gender typing of sport.

McCormick, Shane S. The relationship of sources of sport-confidence and goal orientation, 2000. M.S., Springfield College (Mimi Murray). (168pp 2f $10.00) PSY 2144

The exploration of a relationship between goal orientation and sources of sport-confidence was conducted with male and female, high school and college athletes (N=620). According to the Pearson product-moment correlation coefficients for the total sample, significant (p<.05) positive relationships emerged between Task Orientation of the Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda, 1989; Duda & Nicholls, 1992) and Mastery of the Sources of Sport-Confidence (SSCQ; Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998) as well as Task Orientation and Physical/Mental Preparation of the SSCQ (Vealey et al., 1998). A significant (p<.05) positive relationship was also found between Ego Orientation of the TEOSQ (Duda, 1989; Duda & Nicholls, 1992) and Demonstration of Ability of the SSCQ (Vealey et al., 1998). Differences in the correlations were explored between males and females, and high school and college athletes. No differences existed for high school and college athletes; however, differences in the relationships between goal orientation and sources of sport-confidence were found for males and females.

Miller, Jennifer A. Intrinsic, extrinsic, and amotivational differences in scholarship and nonscholarship collegiate track and field athletes, 2000. M.S., Springfield College (Daryl Arroyo). (114pp 2f $10.00) PSY 2145

The current study was designed to determine the differences in intrinsic, extrinsic, and amotivational levels of scholarship and nonscholarship collegiate male and female track and field student-athletes. The participants consisted of male scholarship (n=30), male nonscholarship (n=30), female scholarship (n=30), and female nonscholarship (n=30) student-athletes. The statistical analyses consisted of seven independent groups, 2x2 (gender and scholarship status) factorial analyses of variance (ANOVA) to compare the mean scores on the seven subscales of the Sport Motivation Scale (SMS; Pelletier et al., 1995). No significant (p>.05) interaction was found between gender and scholarship status and no main effect differences were found for scholarship and nonscholarship for each of the seven subscales. No significant (p>.05) main effects were found for gender on six of the seven subscale scores; however, males (M=4.24) scored significantly (p<.05) higher than females (M=3.72) with respect to the subscale External Regulation. Thus, males were more motivated to participate for material rewards.
Van Voorhis, Amanda J. Sport participation and level of commitment among varying degrees of sport involvement, 2000. M.S., Springfield College (Barbara Jensen). (125pp 2f $10.00) PSY 2141

The study was designed to explore sport commitment and sport participation motivation. The Athletes’ Opinion Survey (AOS; Carpenter & Coleman, 1998) and the Participation Motivation Questionnaire (PMQ; Flood & Hellstedt, 1991) were administered to 79 female collegiate sport participants; 41 were varsity athletes and 38 were intramural participants. Pearson product-moment correlation coefficients were utilized and positive relationships were found between the Sport Commitment, Personal Investments, Recognition Opportunities, and Social Opportunities subscales and the Competitive, Fitness/Skill, and Social subscales; negative correlations were found for Involvement Alternatives. The mean scores for varsity athletes were significantly (p<0.05) higher than for intramural participants on Sport Commitment, Personal Investments, Recognition Opportunities, and Social Opportunities commitment subscales, as well as Fitness/Skill, Social, and Competition participation motives. Certain aspects of sport commitment appear to relate to various sport participation motives and to be different for varsity and intramural participants.

Williams, Lauren H. The effect of distraction during cycle ergometry on ratings of perceived exertion and affect scores in overweight individuals, 2000. M.A., University of North Carolina, Chapel Hill (Bonita Marks). (75pp 1f $5.00) PSY 2147

The purpose of this study was to determine the effect of distraction, in the form of reading, on ratings of perceived exertion (RPE) and affect scores during moderate-intensity cycle ergometry in mild to moderately obese individuals. Specifically, this study examined these ratings in response to different types of reading materials (high-interest reading distraction, low-interest reading distraction, no reading distraction). Fourteen subjects participated in three 30-minute practice cycling trials and three 30-minute experimental trials in which RPE and affect were measured at ten-minute intervals (10 minutes, 20 minutes, 30 minutes). Reading materials were given to the subjects during two of the experimental trials, and one trial served as a control condition. Repeated measures ANOVA did not reveal any significant differences between treatment conditions (F=1.113, p=0.360) or any interaction effect between treatment conditions and time (F=0.660, p=0.634). However, a significant increase in RPE scores over time was found (F=9.283, p=0.004). A Friedman Test with Fisher’s Exact Test did not reveal any significant differences in affect scores between treatment conditions over time (p=0.236). Paired samples T-tests for RPE scores at minute 30 of each treatment condition did not reveal any significant differences between treatment conditions.
Additionally, a Friedman Test with Fisher’s Exact Test for affect scores at minute 30 of each treatment condition did not reveal any significant differences between treatments.

**MOTOR LEARNING AND CONTROL**

**Bargren, Melinda.** *The effects of a motor development program on preschool children’s motor skills*, 2000. M.S.Ed., Northern Illinois University (Cersida Garcia). (69pp $5.00) PSY 2148

This study looked at the effects of developmental instruction and practice on throwing and kicking skills for 2- to 6-year-old children attending a motor development research program. Three groups were examined. The Experimental Group I attended the program for a total of 10 weeks; the Experimental Group II attended the program for 20 weeks; and the Control Group did not receive any instruction on fundamental motor skills. It was hypothesized that children in the experimental groups would have a greater percentage of improvement in throwing and kicking skill levels by the end of the study. A pre-test and post-test were conducted on all groups to assess their levels of throwing and kicking skills according to the Total Body Approach. Data were collected and categorized both live and by viewing videotapes of the testing performance. Data were analyzed using descriptive statistics comparing individual performance within each group and among the groups. Results showed that children in the experimental groups who had received formal instruction and structured practice in a motor development program had greater percentages of increased skill levels or no change in skill levels of throwing and kicking as compared to children from the control group. This study supports the importance of early childhood motor development instruction because it suggests that children attending programs of developmental instruction and practice are at an advantage in their development of motor skills.

**Crowell, Dean H.** *The effect of fatigue on postural stability and neuropsychological function*, 2000. M.A., University of North Carolina, Chapel Hill (Kevin Guskiewicz). (117pp 2f $10.00) PSY 2146

Postural stability and neuropsychological evaluation are important components of sideline concussion management. The purpose of this study was to investigate the effects of fatigue on two clinical sideline evaluation tools, the Balance Error Scoring System (BESS) and the Sideline Assessment of Concussion (SAC). Thirty subjects (16 female and 14 male) who participate in collegiate club sports were tested at baseline and immediately following a fatigue protocol. Statistical analysis revealed a significant decrease in postural stability in a fatigued state (p<.05). Tandem-foam and tandem-tremor trials produced higher error scores during the fatigue trials than during the non-fatigued trials. Analysis did not reveal statistically significant differences in SAC performance, although the results revealed a trend towards potentially higher mean score under fatigued conditions. Concussion history did not have a significant impact on baseline or fatigued state postural stability and cognitive function. Clinicians should take into account that decreased postural stability and improved cognitive performance may occur if an athlete is evaluated while in a fatigued condition.

**Gervais, Pierre D.** *Golf putting and preferences for cognitive training*, 2000. M.S., Springfield College (Mimi Murray). (115pp 2f $10.00) PSY 2137

The investigation was designed to determine individual differences in cognitive preferences, and, once given a cognitive treatment program (self-talk or imagery), determine which of the programs was more effective with putting performance. Participants were 63 male and female students taking a beginner level golf skills class. Four introductory golf skills classes were randomly assigned to either a self-talk or imagery training program, resulting in two self-talk and two imagery groups. Participants from each of the programs were compared to determine if cognitive treatment programs related to improved performance of a relatively simple motor skill, putting. An independent groups design was utilized with one independent groups factor (training programs for imagery or self-talk) and one dependent variable (putting performance). A McNemar test was also computed to examine significant change in cognitive preferences for each participant. No significant differences were found for participants receiving the self-talk treatment versus those receiving the imagery training program. No significant differences were found for participants preferences tested pre- to post-treatment. Thus, groups putted similarly and also maintained cognitive preferences pre- to post-treatment.

**Hale, Trevor A.** *Changes in learned motor behavior due to the effects of various forms of augmented kinematic feedback*, 1999. M.Sc., University of British Columbia (Ian Franks). (91pp 1f $5.00) PSY 2142

The present study was conducted to determine the relative effectiveness of four types of augmented feedback on the acquisition of a rapid aiming movement. Static graphic feedback depicting the primary submovement and error correction phases of the just performed movement (Static group) was compared to numeric KR (KR group). In addition, concurrent kinematic feedback (CD group) was compared to delayed kinematic feedback (DD group). It was predicted that delaying kinematic information would facilitate the performance of the DD group during no-KR
Hall, David W. The effects of Pilates-based training on balance and gait in an elderly population, 1998. M.S., San Diego State University (Jeanne F. Nichols). (55pp 1f $5.00) PSY 2131

The purpose of this study was to examine the effects of Pilates-based training on balance and gait in an elderly population. Thirty-one men and women ranging in age from 65 to 81 years (\(\bar{X} \pm SD=69.5 \pm 4.1\) yr) began the study, and 24 subjects completed the 10-week training program and all post-treatment measures. Subjects were randomly assigned to a traditional strength plus flexibility training group (SPF, \(n=9\)), a Pilates-based training group (PBT, \(n=9\)), or a no exercise control group (CON, \(n=6\)).

Pre- and post-training measurements of static and dynamic balance were performed on the Kinesthetic Ability Training (KAT 2000) balance platform. The Berg Balance Scale (BBS) was used as a field measure of balance and gait. Three (group) x 2 (pre/post) repeated measures ANOVA with the alpha level set at \(p<0.10\) demonstrated a significant group x time interaction \((p=0.028)\) for static balance on the KAT, with PBT improving more than the SPF group. A significant time effect \((p=0.066)\) on the KAT, as well as the BBS \((p=0.009)\), demonstrated that all three groups improved in dynamic balance. These results indicate that PBT is an effective mode of exercise for improving static or postural balance in elderly adults, whereas the complexity of dynamic balance makes it difficult to measure and determine the effectiveness of this or any training protocol. These results suggest that PBT can also improve dynamic balance in elderly adults, but more research in this area is needed to determine the best tool to assess this complex motor skill.

Harty, Tyson H. The application of human motor control principles to a collective robotic arm, 2000. M.S., Oregon State University (Gene K. Korienek). (96pp 1f $5.00) PSY 2151

Current robots are no match for biological organisms when adapting to real world, dynamic environments. Collective control strategies, such as those used by synergistic biological systems composed of large numbers of identical parts like the human nervous system, provide a novel and alternative approach for the design of fault tolerant, adaptable robotic systems that have traditionally relied on centralized control. In this research, a robotic arm composed of multiple identical segments in a collective computational architecture was tested for its ability to produce adaptive pointing and reaching behavior. The movement rules for these robotic arm segments were based on the concepts of the “reflex arc” and the “action system” in the human nervous system. Robotic arms of three to seven encapsulated segments were tested. These arms received no central directions and used no direct information exchange. The arms were sensor-driven at their distal, or leading, outstretched ends to maximize pointing accuracy on a two-dimensional target plane. The remaining non-distal segments in the arms were moved in a sequential order using sensed locally-available movement information about neighboring segments. Successful pointing and reaching behavior was observed in situations with and without movement obstacles. This led to the
Inamura, Chikako. The effect of t’ai chi ch’uan upon selected fitness components of older women, 1999. M.S., Slippery Rock University (Gary Pechar). (68pp 1f $5.00) PSY 2127

Nineteen older women, ranging in age from 55 to 89 years, participated in T’ai Chi exercise twice a week for six weeks. Measurements of balance, flexibility, muscular strength, neuromuscular coordination, and blood pressure were evaluated before and immediately after the six-week T’ai Chi training. The data were analyzed by utilizing dependent t-tests. The results revealed that there was no significant mean difference in balance and muscular strength between the pre-test and post-test. There was, however, a significant increase in flexibility and neuromuscular coordination between the pre-test and post-test (p<.05). Although there was no significant change in systolic blood pressure, diastolic blood pressure was significantly reduced (p<.05).

Pester, Robyn M. The role of lateral balance control in gait-initiation and single-leg-flexion movements, 2000. M.S., University of Oregon (Marjorie H. Woollacott). (147pp 2f $10.00) PSY 2128

For older adults, falls are a frequent occurrence during gait-related activities. Older adults’ neuromuscular responses to unexpected anterior/ posterior perturbations during gait are smaller and later than those of young adults. This study compared the automatic postural responses (onsets, amplitudes, and sequencing patterns) in young versus older adults during a rapid gait-initiation and single-leg-flexion task elicited by either a somatosensory cue (0.1 cm @ 10 cm) or a lateral perturbation (10 cm @ 10 cm/s) towards the initial swing or stance leg. Older adults (n=12) were found to respond with slower, smaller neuromuscular responses for the swing abductors and faster and larger responses in the stance tibialis anterior than young adults (n=9). This suggests a preference for an ankle strategy by the older adults and a preference of a more efficient hip strategy by the young adults in response to a lateral balance threat.

SOCIAL PSYCHOLOGY

Collichio, Gary S. Peer group support and propensity for violence against women: a study of male intercollegiate athletes, 2000. M.S., State University of New York, Brockport (Merrill J. Melnick). (63pp 1f $5.00) PSY 2152

The perception of domestic violence and sexual assault has become particularly discernible in the area of sport. Male peer support of abuse and social ties with abusive male peers has predicted violence against women. This study investigates whether male peer support, within the context of male team sports, is related to psychological and behavioral dispositions for violence against women. Male athletes from several teams were surveyed during the 1998-99 academic year. All of the athletes were between 18-25 years and members of intercollegiate varsity or junior varsity teams (N=153). These teams were further divided into combative/contact sports teams (N=88) and non combative/non-contact sport teams (N=65). For comparison purposes, a group of college males not affiliated with any all-male social groups were surveyed (N=37). The questionnaire was developed to measure male peer support (independent variable) and propensity for violence against women (dependent variable). Male peer support was measured by questions regarding attachments to abusive peers, informational support, and peer pressure to have sex. Propensity for violence against women was measured by questions included in a behavioral index, and a psychological scale for violence. Analyses of Variance were calculated to determine if the assault related variables differed significantly by groups and by sports. The first ANOVA showed male athletes differed significantly from male non-athletes on four of the five assault variables (p<.05). A second ANOVA determined statistically significant differences among all three groups: male non-athletes, male combative/contact sport athletes, and male non combative/non-contact sport athletes. In order to locate significant differences among the three groups, independent t-tests were calculated which compared: male athletes to male non-athletes, male combative/contact athletes to male non-combative/non-contact athletes, male noncombative/non-contact athletes to male non-athletes, and male combative/contact athletes to male non-athletes. The findings of this study show: (1) male athletes receive more social support from their peers to do violence against women than do male non-athletes; (2) the more social support males receive, the more likely they will hold attitudes and exhibit behaviors associated with violence against women; and (3) males who participate on combative/contact sport teams have a greater behavioral disposition for violence against women. No support was found for the proposition that male combative/contact sport team members possess a greater psychological disposition for violence against women than male athletes who participate on non combative/non-contact sport teams.
Kohl, Christopher C. *Parental influences in youth sport*, 2000. M.S., Springfield College (Mimi Murray). (132pp 2f $10.00) PSY 2149

The investigation was designed to determine whether mothers and fathers differed in the sport socialization scores of their children, as well as socialization differences in team versus individual sports. Participants were 117 parents of high school athletes who were asked to complete the Sport Socialization Questionnaire (Woolger, 1992). A total of three 2 (gender of parent) x 2 (gender of child) x 2 (type of sport) ANOVAs were conducted on the Verbal Encouragement, Unconditional Praise and High Goals subscales. Six 2 (gender of child) x 2 (type of sport) ANOVA were conducted on the No Goals/Effort Goals, No Goals, Effort Goals, Directiveness, General Directiveness, and Specific Directiveness subscales. Mothers and fathers socialized their children to sport similarly with the exception of more verbal encouragement to daughters as compared to sons. Fathers had more effort goals for their children who participated in team versus individual sports. In addition, fathers had more ‘No Goals’ or enjoy goals for their children who participated in individual versus team sports. Future research should focus on the perceptions of children toward parental socialization, and how these perceptions influence the enjoyment levels of children in sport.

Krump, Jason G. *Identification of athletes by athletes at Eastern Washington University and the perceived media’s role in that identification*, 2000. M.S., Eastern Washington University (Scott Melville). (85pp 1f $5.00) PSY 2132

Since the implementation of Title IX in 1972, participation rates for female athletes have grown steadily, to the point where 40% of athletes who participate in high school and college sports are female. However, the media’s coverage of female athletes has not kept up with the increased participation rates and has continued to focus on male sports. The purpose of this study was to examine the identification of athletes by male and female athletes from Eastern Washington University. In addition, the athlete’s perception of the media’s role in their identification of athletes and of the media’s coverage devoted to each gender was studied. An inventory of the Spokesman-Review sports section and sports television programming from ESPN, CNN and Spokane local television stations was done, along with a survey of 205 Eastern Washington athletes. The results of the media inventory demonstrated that little has changed from past studies of coverage given to male and female sports. In addition, the placement of female stories and articles was not equal to placement for males in prominence. The survey results showed that television played a large influence in the athletes selected by Eastern athletes, especially the males. The other influence toward the selection of athletes that was shown was the sport the athlete played. While the participation rates between male and female athletes have narrowed, the media coverage between the genders has not. The results from the surveys demonstrated that, while females identified female athletes more than male athletes, both identified more male athletes, suggesting media’s coverage probably does have an influence.
This index includes keywords for titles published in microfiche format by Microform Publications in Volume 13, No. 2 (October 2000).

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 author’s name. 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 keywords appear in alphabetic order and are followed by the author names of the doctoral or master’s theses that they refer to. Because each thesis will have more than one keyword, author names appear several times under different keywords. The author names are followed by the research and statistical methods used in the study. These are contained in brackets—the letters in front of the dash refer to the research methods, those following the dash denote the statistical methods. The methods information is followed by the subject code and number for the study. The following example illustrates the elements of each entry.

**BIOMECHANICS**  
Allen, D.M. [D,MA-DE,MAV] PE 3815  

*Biomechanics* is one of the keywords of a study by D. M. Allen. The research methods used in the study include Descriptive and Mechanical Analysis techniques; statistics are Descriptive and Multivariate Analysis of Variance. The study’s subject code is PE 3815. To find the title of the study as listed in part I of the *Bulletin*, use the author index in the back of the book to find the page number on which the study by D. M. Allen 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 in the table on the following page.
METHODS

<table>
<thead>
<tr>
<th>A</th>
<th>Anthropometry</th>
<th>GE</th>
<th>Genetic</th>
<th>MAN</th>
<th>Manual</th>
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<tr>
<td>AR</td>
<td>Action Research</td>
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<td>C</td>
<td>Case Study</td>
<td>I</td>
<td>Interview</td>
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<td>CA</td>
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<td>IA</td>
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<td>Review</td>
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<td>JA</td>
<td>Job Analysis</td>
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<td>Survey</td>
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<td>COM</td>
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<td>L</td>
<td>Laboratory</td>
<td>SD</td>
<td>Semantic Differential</td>
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<td>D</td>
<td>Descriptive</td>
<td>LR</td>
<td>Library Research</td>
<td>TC</td>
<td>Test Construction</td>
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<td>DA</td>
<td>Documentary Analysis</td>
<td>M</td>
<td>Model</td>
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<tr>
<td>E</td>
<td>Experimental</td>
<td>MA</td>
<td>Mechanical Analysis</td>
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STATISTICS

<table>
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<tr>
<th>%</th>
<th>Percent</th>
<th>KC</th>
<th>Coefficient of Consistence</th>
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<tbody>
<tr>
<td>AC</td>
<td>Analysis of Covariance</td>
<td>KR</td>
<td>Kuder-Richardson</td>
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<td>AV</td>
<td>Analysis of Variance</td>
<td>KS</td>
<td>Kolmogorov-Smirnov</td>
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<td>AV(F)</td>
<td>Analysis of Variance (Friedman)</td>
<td>KW</td>
<td>Kruskal-Wallis</td>
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<td>B</td>
<td>Binomial</td>
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<td>Biserial Correlation</td>
<td>LSD</td>
<td>Least Significant Variance</td>
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<td>Bonferroni Method</td>
<td>MAC</td>
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<td>Canonical Correlation</td>
<td>MAV</td>
<td>Multivariate Analysis of Variance</td>
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<td>Contingency Coefficient</td>
<td>MDA</td>
<td>Multivariate Discriminant Analysis</td>
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<td>CO</td>
<td>Cohen’s Coefficient of Agreement</td>
<td>MMM</td>
<td>Multivariate Mixed Model</td>
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<td>CQ</td>
<td>Cochrans Q Test</td>
<td>MR</td>
<td>Multiple Regression</td>
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<td>Chi Square</td>
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<td>Coefficient of Variation</td>
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<td>Newman-Keuls</td>
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<td>DE</td>
<td>Descriptive</td>
<td>PA</td>
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<td>Delphi Method</td>
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<td>Discriminant Analysis</td>
<td>PR</td>
<td>Phi Coefficient</td>
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<td>Duncan Multiple Regression</td>
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<td>Multiple Correlation</td>
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<td>Dunn Test</td>
<td>RC</td>
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<td>Curvilinear Correlation</td>
<td>RD</td>
<td>Spearman Rank Correlation</td>
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<td>F</td>
<td>Flanagan Procedure</td>
<td>RE</td>
<td>Regression Equation</td>
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<td>RM</td>
<td>Repeated Measures</td>
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<tr>
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<td>Fisher’s Exact Test</td>
<td>RPM</td>
<td>Pearson Product-Movement</td>
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<td>FZ</td>
<td>Fisher’s Z</td>
<td>SB</td>
<td>Spearman-Brown Prophecy</td>
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<td>G</td>
<td>Graphic</td>
<td>SCH</td>
<td>Scheffe’s Method</td>
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<tr>
<td>GA</td>
<td>Gamma Method of Association</td>
<td>SEE</td>
<td>Standard Error of the Estimate</td>
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<td>Greenhouse Geisser Conserv-</td>
<td>SI</td>
<td>Sign Test</td>
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<td>SP</td>
<td>Split Plot Repeated Measures Analysis</td>
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<td>HA</td>
<td>Hartley’s Method</td>
<td>SSP</td>
<td>Split-Split Plot Repeated Measures Analysis</td>
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<tr>
<td>HS</td>
<td>Hull’s Method</td>
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<td>HV</td>
<td>Homogeneity of Variance</td>
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<tr>
<td>K</td>
<td>Kirk’s Test</td>
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### 1990
- Iagulli, J. J. [D, Q-DE, %] PE 4112

### 1994
- Sauches, N.
  - [D, S-DE, CS, %, G] PE 4154

### 1995
- Sauches, N.
  - [D, S-DE, CS, %, G] PE 4154

### 1996
- Sauches, N.
  - [D, S-DE, CS, %, G] PE 4154

### 1997
- Sauches, N.
  - [D, S-DE, CS, %, G] PE 4154

### 1998
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  - [D, S-DE, CS, %, G] PE 4154

### 1999
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  - [D, S-DE, CS, %, G] PE 4154

### 2000
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  - [D, S-DE, CS, %, G] PE 4154

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  - [D, S-DE, CS, %, G] PE 4154

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  - [D-DE, %, AV, RM, RPM, G] PE 4127

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- Grasso, A. T.
  - [D, Q, DA-DE, FA, AV, RPM, T, G] PSY 2138

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- Caputo, J. L.
  - [D, A, L, Q-DE, RPM, G] HE 669

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  - [D, I, Q, DA-DE] PE 4105

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  - [D, Q, AR-DE, %, AV, RM, TU, T] PH 1716

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